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SOCIOECONOMIC
AND
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LAND USE SURVEY

Moffat , Routt and Rio Blanco Counties , Colorado

SUMMARY

Prepared For
W. R. GRACE & CO.

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LAND USE SURVEY
MOFFAT, ROUTT AND RIO BLANCO COUNTIES
COLORADO
SUMMARY REPORT

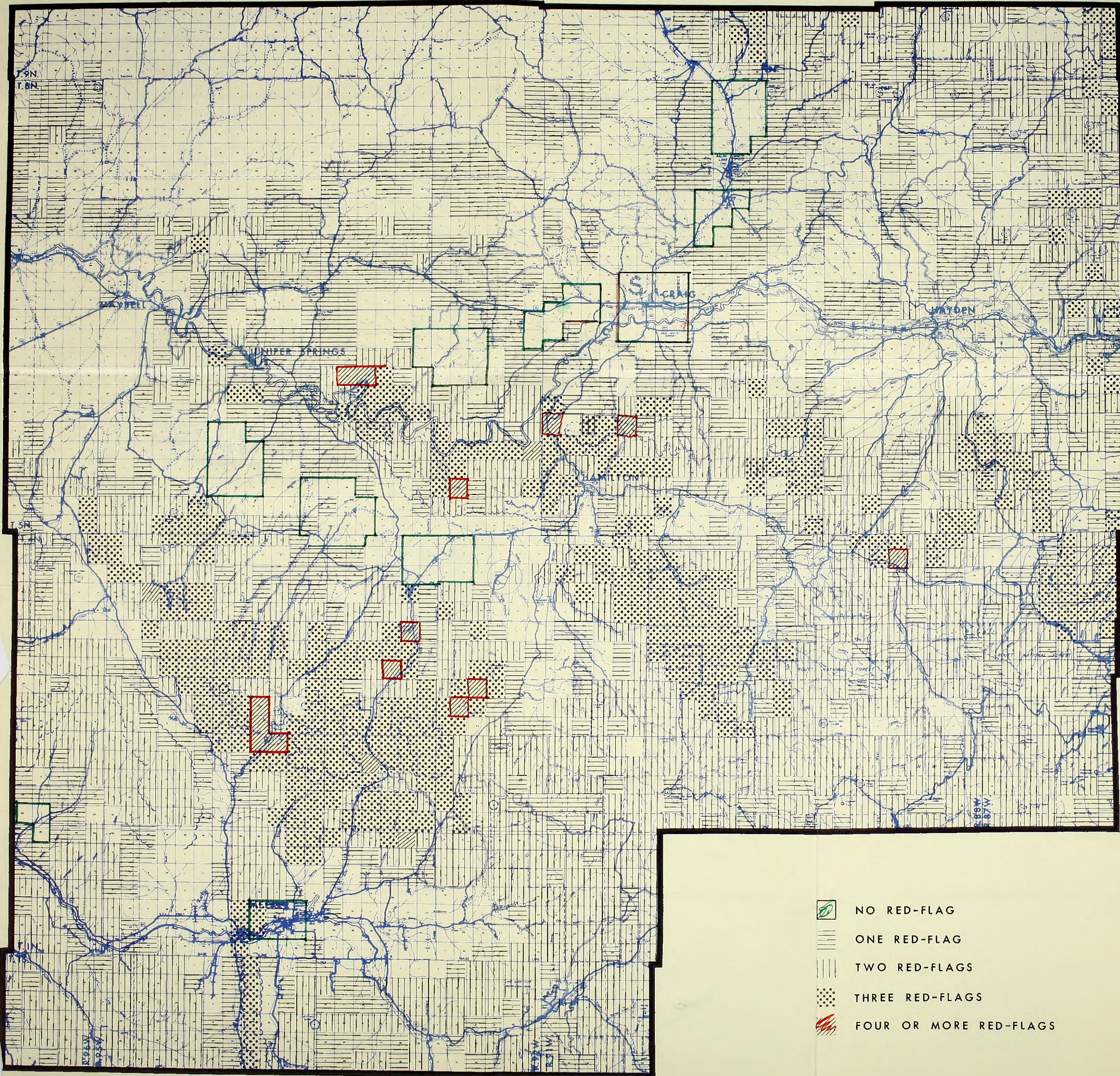
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


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FIGURE 8

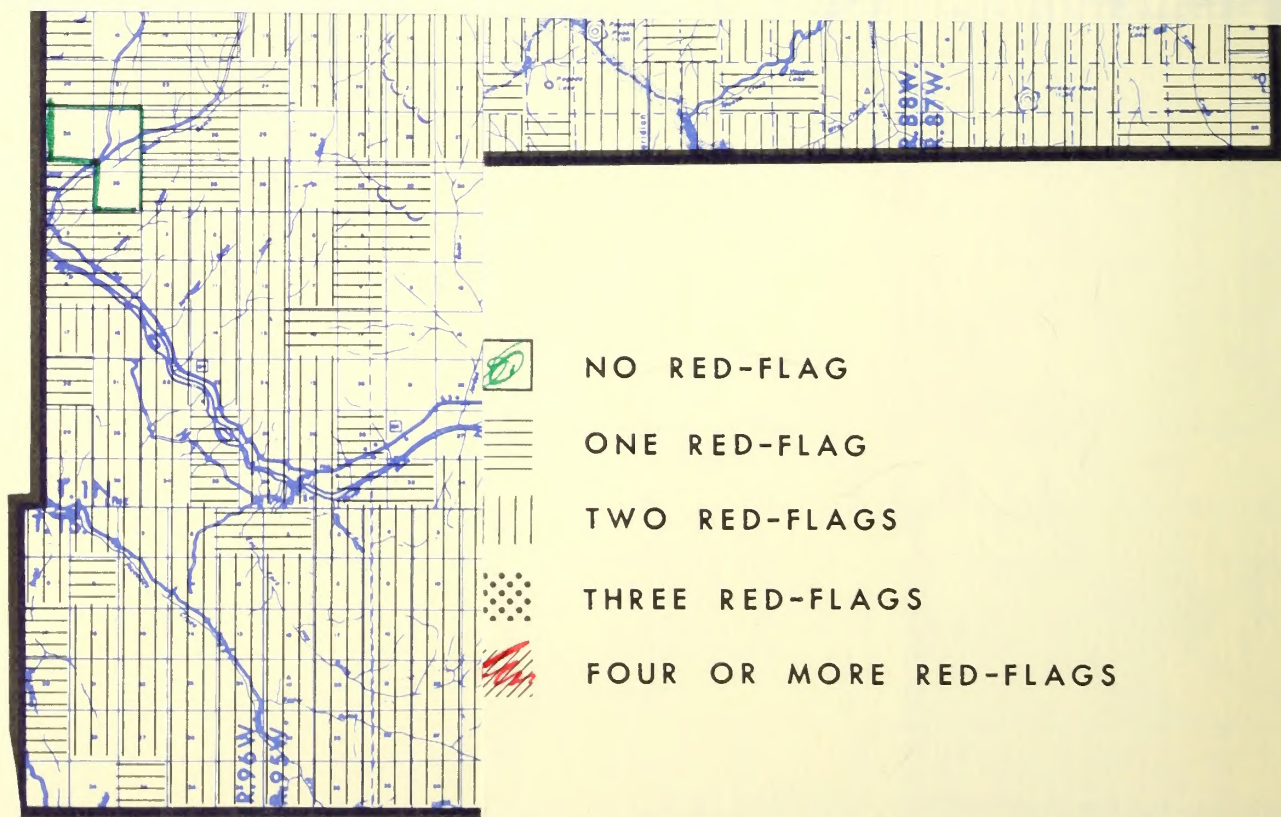


FIGURE 8



Engineers Architects Planners

2600 South Parker Road, Parker Place Four, Denver, Colorado 80232 (303) 751-9151

April 24, 1975

VTN 1395-30

Mr. Charles W. Margolf
Director of Western Operations
W. R. Grace & Co.
Mining Division
The Denver Technological Center
7935 E. Prentice Avenue
Englewood, Colorado 80110

Dear Mr. Margolf:

VTN is pleased to submit to you the Summary Report for the "Socioeconomic and Environmental Land Use Survey for Moffat and Rio Blanco Counties, Colorado." This report covers a 3600 square mile area around the proposed Colowyo Mine site in terms of development potential to facilitate short-term and long-term growth due to energy-related development.

The contents of this report cover the major socioeconomic and environmental considerations including growth inducement and population forecasts, housing needs and availability, utility demands and capacities, selected community services, public attitudes and opinions, and general governmental policies. In addition, this report covers the results of the computer cellular mapping process which was used to compile a composite of all characteristics by square mile sections in order to assess possible environmental impacts. The result of this process was a selection of nineteen areas which would experience minimal environmental impact due to community development. Of these, eleven areas and the communities of Craig and Meeker were evaluated in further detail for community development potential.

Because of the complexity of the material presented, the information is organized three ways: The conclusions and salient points are summarized in Section II; additional

Mr. Charles W. Margolf
Page Two
April 24, 1975

technical information by topic is presented in Sections III, IV and V; necessary supportive information is contained in the Appendices. The actual working papers, computer printouts, forecasts, and computer composite maps are available separately from this report.

The accompanying presentation maps which are a representation of the various steps of the cellular mapping process should be referred to in conjunction with this document.

We appreciate the opportunity to perform this study and hope that we can continue to be of service to you in the future.

Please contact us regarding any questions or additional information as required.

Sincerely,


Mary C. Battershill
Project Manager

MCB/tlc

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I. INTRODUCTION

A. PURPOSE

The purpose of this study is to provide the necessary socioeconomic and environmental background data to indicate community development areas within Moffat, Routt, and Rio Blanco Counties which will accommodate the incoming mineral related population with minimal impacts to the social and physical environment. This study will provide the information by which W.R. Grace & Co. can aid in the community planning processes necessary to minimize growth-related socioeconomic problems.

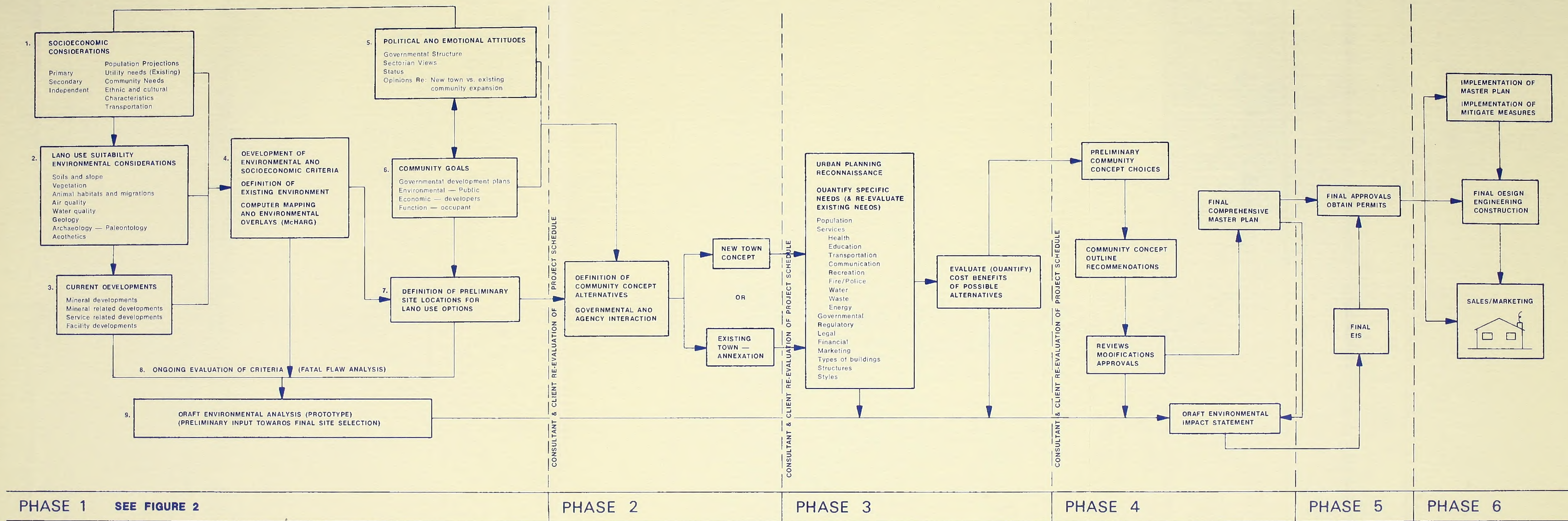
B. METHODOLOGY AND REPORT OVERVIEW

Figure 1 represents a conceptual approach to defining the various steps taken in planning a community development. This approach was used to ascertain the background data that should be included to aid in the process of locating where development should occur. Phase 1 of this diagram was then scoped in further detail to assure that the essential background data was included. This phase, which is the scope of work for this study, is shown in Figure 2.

Phase 1 consists of four basic steps:

1. Definition of the Study Area, preliminary research and regional reconnaissance
2. Data coding and field inventory, scenario development, and community profiles
3. Regional synthesis and area selections
4. Micro-synthesis and ordinal ranking of areas

In Step 1, the Study Area was defined as a 30-mile radius originating from the proposed Colowyo Mine site. The outer portion of this radius was then adjusted to take into consideration towns expected to be impacted by the Colowyo Mine development, natural topographic barriers and National Forest lands. The result was a rectangular area of approximately 3,600 square miles. Figure 3 delineates the general region and the project location.

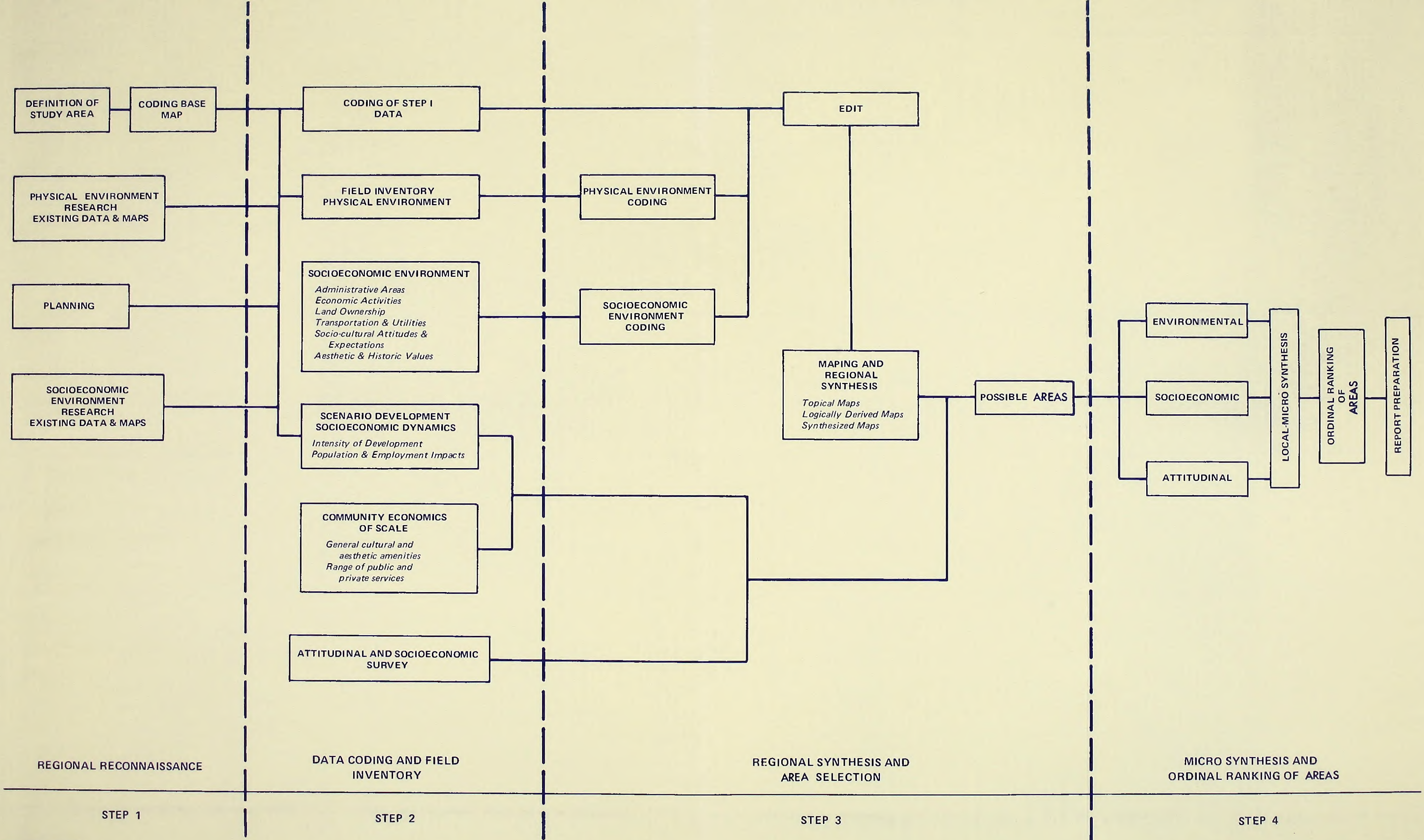


① What about financial feasibility?



CONCEPTUAL FLOW OF VARIOUS STAGES FOR THE DESIGN AND IMPLEMENTATION OF A NEW COMMUNITY DEVELOPMENT

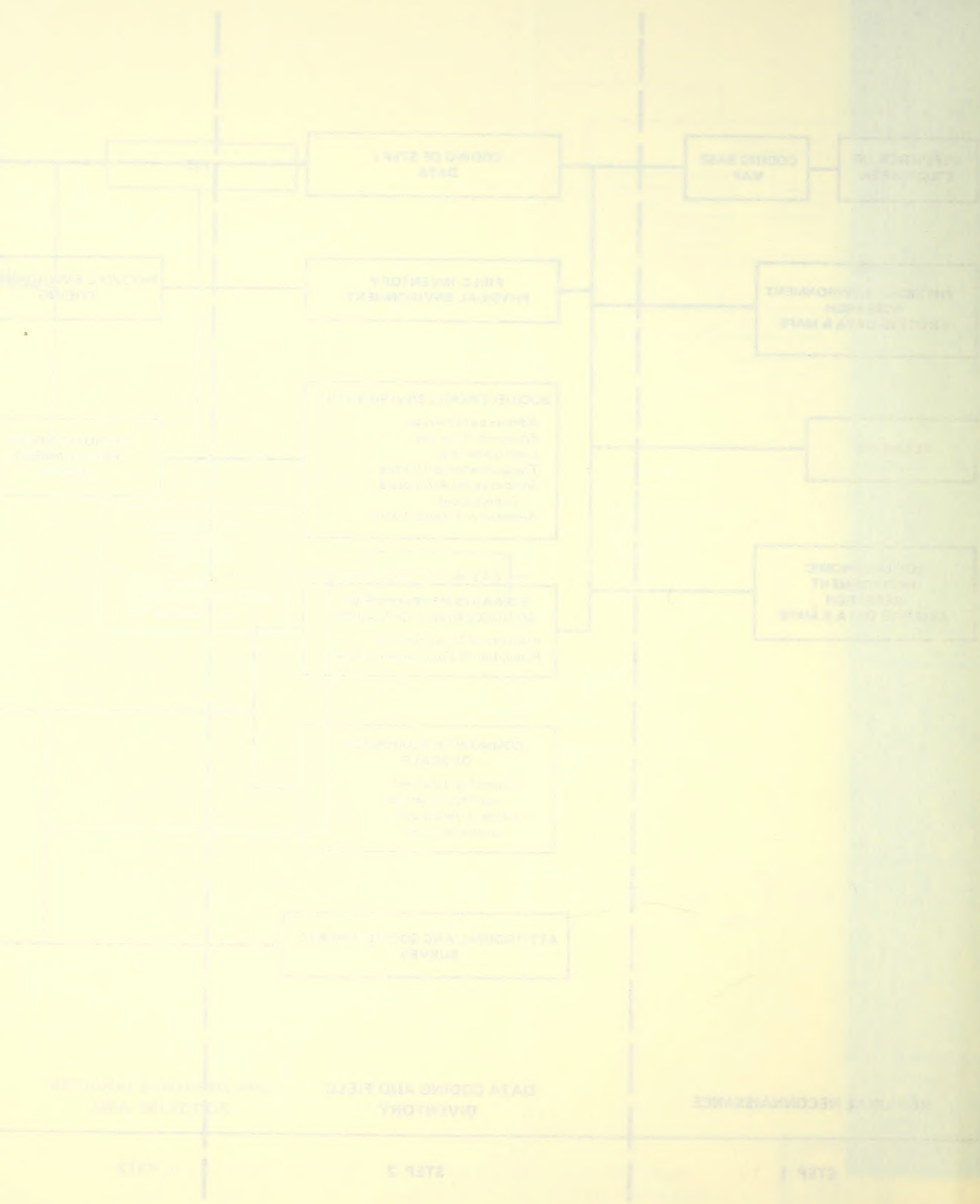
FIGURE 1

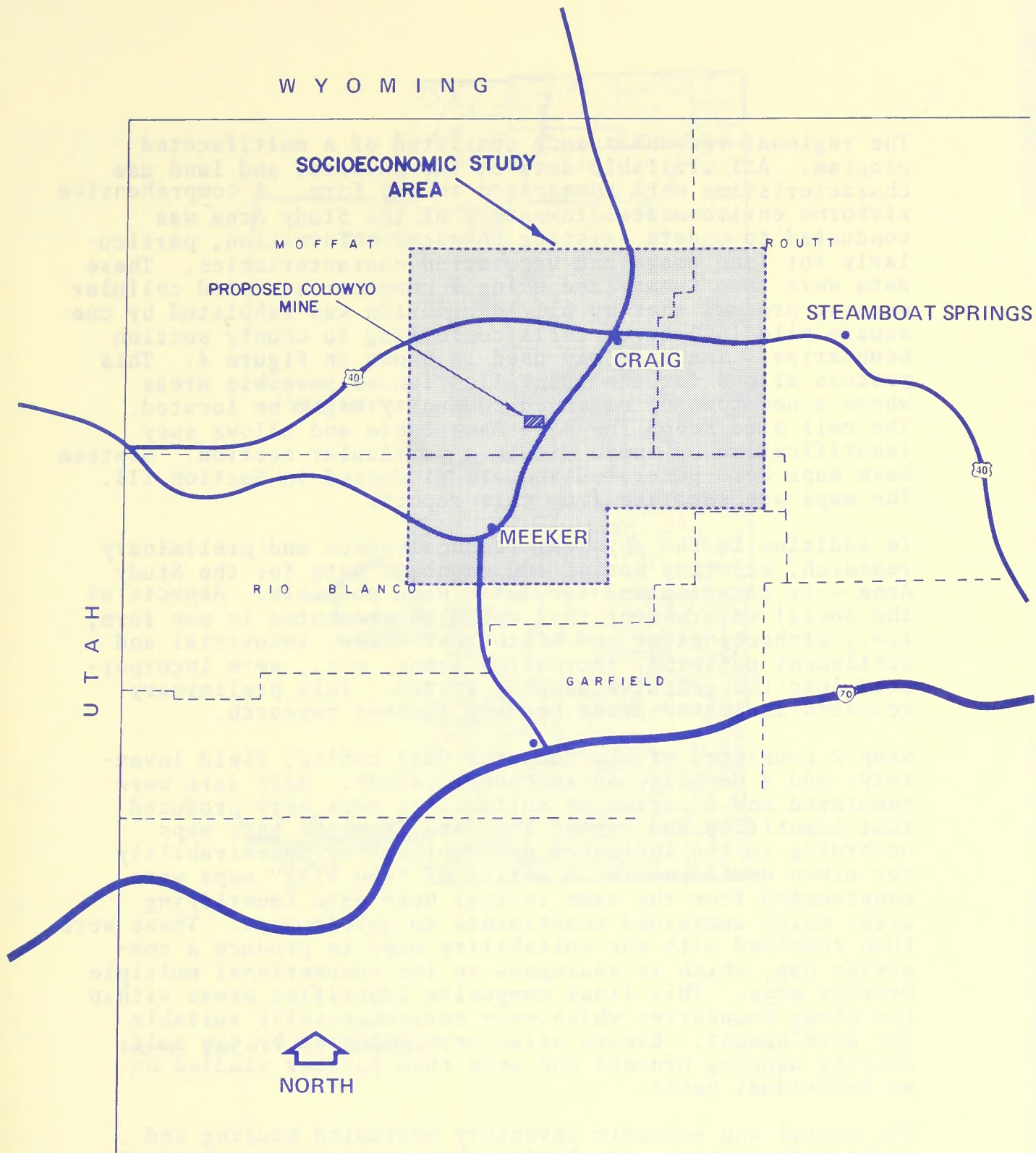


SCHEDULE OF WORK FOR PHASE 1

FIGURE 2







LOCATION OF SOCIOECONOMIC STUDY AREA

FIGURE 3

SOURCE COLORADO STATE DEPT. OF HIGHWAYS, 1974

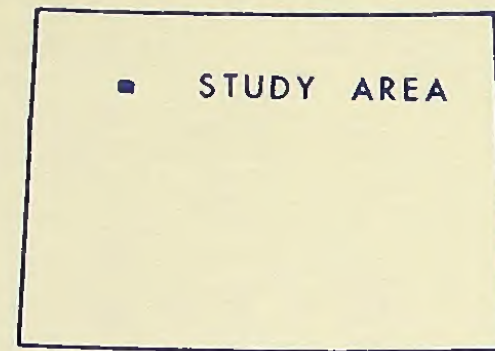


The regional reconnaissance consisted of a multifaceted program. All available data on the physical and land use characteristics were summarized in map form. A comprehensive airborne environmental inventory of the Study Area was conducted to update existing physical information, particularly for land usage and vegetation characteristics. These data were then summarized using a computer assisted cellular mapping process whereby all information was tabulated by one-square mile (640-acre) cells conforming to county section boundaries. The base map used is shown on Figure 4. This process allows for the identification of possible areas where a new town or extended community might be located. The cell size keeps the data manageable and allows easy identification by topic within a particular section. Sixteen base maps were generated and are discussed in Section III. The maps are separate from this report.

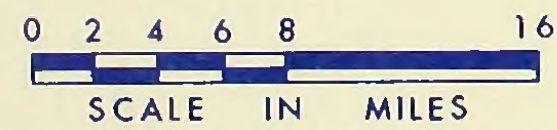
In addition to the physical reconnaissance and preliminary research, existing social and economic data for the Study Area were gathered and tabulated when possible. Aspects of the social environment that could be presented in map form, i.e., archaeological and historical sites, industrial and settlement patterns, recreation areas, etc., were incorporated into the computer mapping system. This preliminary research indicated areas needing further research.

Step 2 consisted of the computer data coding, field inventory, and a detailed socioeconomic study. Base data were tabulated and a series of suitability maps were produced that identified and ranked the data from the base maps according to the indicated desirability or undesirability for urban development. A series of "red flag" maps were constructed from the same initial base data identifying areas which contained constraints to development. These were then combined with the suitability maps to produce a composite map, which is analogous to the conventional multiple overlay maps. This final composite identified areas within the study boundaries which were environmentally suitable for development. Eleven areas were selected by the suitability mapping process and were then further studied on an individual basis.

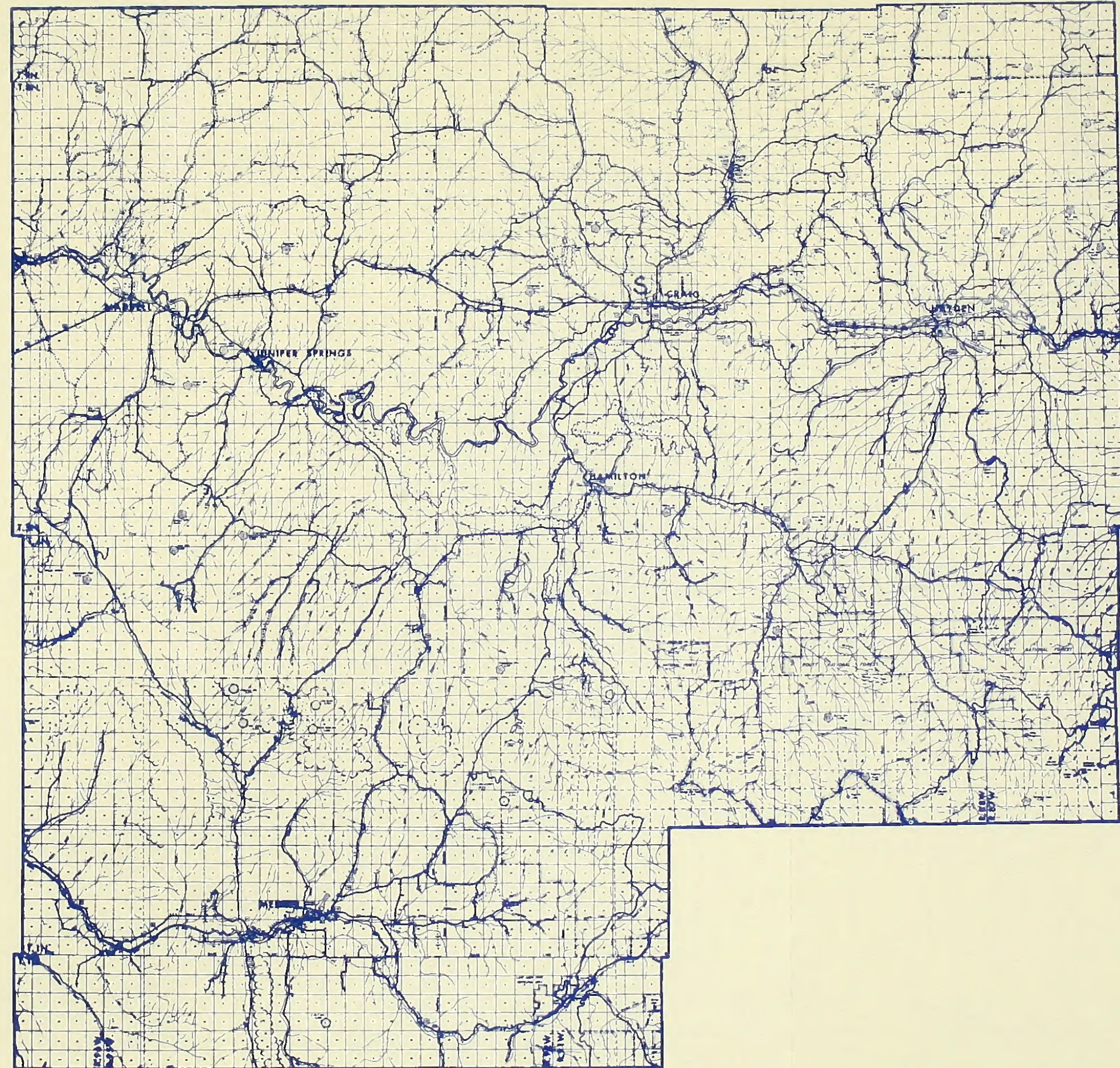
The social and economic inventory evaluated housing and capital facilities, population characteristics, political jurisdictions, public policies, public attitudes and opinions regarding growth. This information was necessary to determine the potential problems caused by growth and the regional capacity to absorb that growth. These inventories also indicated whether or not a new town, defined by Colorado policy as a free-standing community, is a viable alternative for community development on the western slope.



VICINITY MAP



NOTE: EACH CELL REPRESENTS ONE SQUARE MILE



SELECTED STUDY AREA

SOURCE: VTN

FIGURE 4



The population analysis concentrated upon the determination of the incremental population growth which could be expected to occur as the energy resources of the area are developed. Several steps were required to make reasonable projections based upon known developments. These are as follows:

- Identification of all potential energy resource sites under consideration for future development which could affect growth patterns in the Study Area, required work force for these projects (construction and permanent employees), and the staging or estimated starting dates of the developments
- Development of appropriate income and employment multipliers relative to construction workers and permanent mining employees in the region, utilizing known indicators from similar mineral development areas within the Rocky Mountain Region
- Application of income and employment multipliers to base work force to calculate total employment and income implications of the proposed projects
- Application of assumptions about family size to employment data to determine total population growth in the area caused by mining activities

DON'T THESE DEAL PRIMARILY WITH TRANSPORTATION? A GOOD IDEA, ANYWAY!
A gravity model was then developed to allocate the incremental population throughout the region. The model allocated the population under several alternative situations without new community development:

- ARE BLM FILES THE BASELINE. WHO OWNS THE MAJORITY OF MINERAL RIGHTS IN THE STUDY AREA*
- #1 • Energy companies existing or with high probability of development. (These are companies which have filed letters of intent with BLM and which will be included in the Northwest Colorado Coal EIS)
 - #2 • Energy companies with possible development potential within the next five years *HOW WERE THESE IDENTIFIED?*
 - #3 • Oil shale development
 - #4 • Railroad and development requiring the existence of a railroad
 - #5 • Colowyo Mine development as an individual entity
 - #6 • Railroad development as an individual entity. *WHY SEPARATE?*

An additional model was developed to assess population allocation if a new community of 5,000 was constructed within the

Study Area. This model assumed that all energy-related development would occur and considers all possibilities as listed above. The allocation results with and without a new community illustrate those areas of high population growth and indicate where housing demands are greatest and where pressure for expansion of capital facilities will occur. This information is summarized in Sections IV and V and in Appendix F.

During Step 3 the regional information from Steps 1 and 2 was synthesized and applied in the selection of possible areas for community development. The computer mapping process gives a visual indication most suitable for development in terms of physical and land use characteristics. In addition, the housing and capital facilities, population characteristics, public attitudes and other reports indicated general areas where development is most economically feasible. Independent selection processes were incorporated to define 20 areas for possible development. A preliminary inventory was conducted and 11 of the 20 areas were chosen by VTN as recommended areas needing more detailed study. In addition, the remaining portions of Craig not noted by the mapping process and the developable portions of Meeker were added as inventory areas.

Following selection of these areas, a more detailed area-specific analysis insured that the regional analysis and cellular mapping process did not overlook unique features. The population forecasts and capital facilities study were included in this analysis.

Step 4 was a synthesis of all of the data generated in the first three steps. The results were a ranking of areas in terms of their development potential and the definition of problems in housing, capital facilities and community services.

Recommendations made in this report reflect both the results of Phase 1 and the issues needing further study. These are given in Section II.

II. SUMMARY AND RECOMMENDATIONS

A. SUMMARY OF SOCIOECONOMIC IMPACTS

1. ECONOMY

Prior to 1974, the major economic base of the study area was agriculture, with mining and tourism following in importance. It is projected that agricultural development will remain static and that mineral development will increase significantly to become primary economic activity. Tourism will increase but will not be of quantitative importance (see Section IV, Part A).

2. INCOME AND INCOME MULTIPLIERS

The total economic benefit of a project to the region is greater than the income generated directly in the form of salaries and tax revenues. There are three basic sources of income:

- Direct basic income, i.e., salaries and wages paid to mineral industry employees
- Indirect basic income, i.e., income generated to local firms, such as an oil dealer, who sell to a basic industry
- Direct and indirect non-basic income, i.e., income due to the employment and goods generated by the service section within the community (see Section IV, Part B)

RETAIL, WHOLE SALES ?

Direct basic income is estimated using Colowyo Mine figures for 244 permanent mine employees with an average annual income of \$19,000. This yields an estimated total direct basic income of \$386,330 per month.

The indirect basic income estimates were based upon the Sarpy Creek Mine in Montana which has characteristics similar to the Colowyo Mine. These are the only mineral-related indirect income estimates available. The Sarpy Creek Mine employs 71 persons and Colowyo Mine will employ 244 indirect basic income of \$3,416 (per 71 employees) was inflated by a factor equal to $244 \div 71$, or 3.44, which estimates Colowyo Mine indirect basic income at \$11,140 per month.

The total direct basic income (\$386,330) and the total indirect basic income (\$11,740) amounts to \$398,070 per month generated into the regional economy.

Direct and indirect non-basic income is calculated by adding the total amount of direct and indirect basic income which is estimated to become part of the local disposable income (in this case, .76); the portion of the disposable income which will be consumed locally (in this case, .85), and the portion of the local consumption which becomes local income in an indirect manner (in this case, .34). As mentioned earlier, direct basic income plus the indirect basic income equals \$398,070 per month. The total indirect non-basic income is calculated by multiplying the sum of the direct and indirect basic incomes by each of these factors, i.e., (\$123,200) (.76) (.85) (.34), which equals \$122,680. The total income generated from these four sources--direct and indirect basic and direct and indirect non-basic income amounts to \$509,530 per month.

To calculate the multiplier applicable to direct basic income, or that which is a result of Colowyo Mine employment (indirect basic and direct and indirect non-basic) the basic direct income (\$386,330) is divided by the total income generated (\$509,530) to arrive at a multiplier applicable to direct basic income of 1.32. That is, for every dollar generated by Colowyo Mine employees, the regional economy can expect to receive an additional income of \$.32 (see Section IV, Part C).

3. THE EMPLOYMENT MULTIPLIER

The income analysis provides the most reliable basis for evaluating the employment impacts of the Colowyo Mine. The income analysis indicated that the basic income (\$386,330) generated a total income of \$509,530. The difference between these two gives the indirect basic plus non-basic income of \$123,200 per month or \$1,478,000 per year (or that which will be generated beyond the income paid directly to Colowyo Mine employees).

The average wage in the Study Area within the indirect basic and non-basic sectors of the economy in 1975 was estimated to be approximately \$12,900. Using this as the average wage for indirect basic and non-basic sectors, the annual income of \$1,478,000 will create 114 new jobs in the study area (\$1,478,000 ÷ \$12,900). These indirect basic and non-basic sector jobs (114) added to Colowyo Mine employment (243) will yield a total employment change of 357

jobs to calculate an employment multiplier of 1.47 (357 ÷ 244). The employment multiplier of 1.47 states that for every 4 Colowyo Mine employees hired, approximately two additional jobs will be generated within the study area to service those from Colowyo Mine employees and their families (see Section IV, Part C).

4. POPULATION

Population was calculated for 20 known energy-related developments (see Table 23) using 8 forecasts. These forecasts are combinations of energy-related development dependent upon their degree of preplanning and estimated start-up date. These are explained in Table 25. The forecasts which summarize the "best guess" population estimates for the Study Area and for the W. R. Grace & Co. projects are as follows:

- Forecast 1: Those developments which have filed letters of intent to develop with BLM and which will be covered in the North West Coal Environmental Impact Statement
- Forecast 2: Possible development which may occur in the Study Area after 1980 *AGAIN, DATA SOURCES?*
- Forecast 3: The combination of Forecast 1 and 2 with and without new town development
- Forecast 5: All possible development including oil shale impacts with and without new town development *DATA SOURCES?*
- Forecast 6: Colowyo Mine development
- Forecast 7: Railroad development

The new town development was used primarily in aiding allocations of population to existing communities and to see the anticipated attraction of population to a new town if it were available.

To forecast population the following assumptions were made:

- The employment projections by industry as given in Table 23, were the "best guess" possible.
- Average household size for basic and indirect basic employee is 3.5 (see Section IV, Part C).
- Average household size for a construction worker is 2.0 (see Section IV, Part C).

The results of the forecast for selected years are given in Table 1. (For more information refer to Appendix F).

5. ALLOCATION OF POPULATION TO COMMUNITIES

The allocation of population to communities is given in Table 2. Forecast 3 and 5 are given with and without a new town.

6. POPULATION HOUSING DEMAND

Composition of housing needed by the estimated population by forecast were based upon a recent study completed for the oil shale industry by THK Associates. This study stated that housing needs by type of housing are as follows:

Single-Family dwelling units - 50 percent
Multi-Family dwelling units - 25 percent
Mobile-Homes - 25 percent

It is estimated that construction housing demand will be supplied initially by mobile homes (70 percent) but this will decline as the construction phase of development has passed.

Housing demands for the population by type per community (assuming no new town) are given in Appendix F. The summary of the appendicized data are given in Table 3.

7. EXISTING HOUSING FACILITIES

a. Craig

At present, there is no significant number of units available for sale or rent. There are, however, eight proposed projects which, if constructed, could supply 2,013 units. Of these there is projected to be 850 single-family units, 200 multi family units and 963 mobile home estates. It is doubtful that all eight of these projects will be built. Many of these are either in financial difficulties or cannot obtain permits.

b. Meeker

At present there is no housing available for sale or rent. There are three proposed projects: a 12 unit apartment complex; a subdivision with 132 single-family home, 46 units in duplexes and triplexes and 332 trailer homes; and a mobile home court with 400 spaces. These are still in proposal stage.

TABLE 1

**POPULATION CHARACTERISTICS BY EMPLOYMENT SECTOR FOR SELECTED
FORECASTS AND SELECTED YEARS***

	Population			Residences			Number of Families			Dependents		
	Construction	Permanent	Service	Construction	Permanent	Service	Construction	Permanent	Service	Construction	Permanent	Service
Forecast 1: Filed letters of intent with BLM												
1976**	2,560	670	1,430	1,280	190	410	1,880	515	190	410	1,115	765
1978	2,560	1,550	1,450	725	445	415	1,585	290	445	415	1,150	435
1980	1,810	2,910	2,300	905	830	655	2,390	360	830	655	1,845	540
1985	0	3,940	1,920	5,860	1,125	550	1,675	0	1,125	550	2,765	0
1990	0	3,940	1,920	5,860	1,125	550	1,675	0	1,125	550	2,765	0
1995	0	3,940	1,920	5,860	1,125	550	1,675	0	1,125	550	2,765	0
Forecast 2: Possible development which may occur after 1980												
1976	80	390	220	690	110	65	215	15	110	65	190	25
1978	80	150	70	300	45	20	105	15	45	20	80	25
1980	0	150	70	220	45	20	65	0	45	20	65	0
1985	0	880	430	1,310	250	125	375	0	250	125	375	0
1990	0	1,400	660	2,060	400	190	590	0	400	190	590	0
1995	0	1,490	700	2,190	425	200	625	0	425	200	625	0
Forecast 3: Combination of Forecast 1 and 2												
1976	2,640	1,060	1,650	1,320	305	470	2,095	530	305	470	1,305	790
1978	1,530	1,700	1,520	4,750	485	435	1,685	305	485	435	1,225	460
1980	1,810	3,060	2,370	7,240	875	680	2,460	360	875	680	1,915	540
1985	0	4,820	2,350	7,170	1,380	670	2,050	0	1,380	670	2,050	0
1990	0	5,340	2,580	7,920	1,525	740	2,265	0	1,525	740	2,265	0
1995	0	5,430	2,620	8,050	1,550	750	2,300	0	1,550	750	2,300	0
Forecast 5: All possible development including oil shale impacts												
1976	2,650	1,050	1,650	1,325	300	470	2,095	530	300	470	1,300	790
1978	9,850	2,060	5,360	17,270	590	1,530	7,045	1,970	590	1,530	4,070	2,940
1980	3,400	11,450	6,840	20,690	3,270	1,955	6,925	680	3,270	1,955	5,905	1,015
1985	50	14,270	6,790	21,560	4,080	1,940	6,045	10	4,080	1,940	6,030	15
1990	0	14,790	7,020	21,810	4,225	2,005	6,230	0	4,225	2,005	6,230	0
1995	0	14,880	6,960	21,840	4,250	1,990	6,240	0	4,250	1,990	6,240	0
Forecast 6: Colowyo Mine development												
1976	200	430	280	910	125	80	305	40	125	80	245	60
1978	0	740	350	1,090	210	100	310	0	210	100	310	0
1980	0	850	400	1,250	245	115	360	0	245	115	360	0
1985	0	850	400	1,250	245	115	360	0	245	115	360	0
1990	0	850	400	1,250	245	115	360	0	245	115	360	0
1995	0	850	400	1,250	245	115	360	0	245	115	360	0
Forecast 7: Railroad development												
1976	200	0	90	290	0	25	125	40	0	25	65	60
1978	200	50	110	360	15	25	140	40	15	25	80	60
1980	0	100	50	150	30	15	45	0	30	15	45	0
1985	0	100	50	150	30	15	45	0	30	15	45	0
1990	0	100	50	150	30	15	45	0	30	15	45	0
1995	0	100	50	150	30	15	45	0	30	15	45	0
Forecast 8: Railroad development												
1976	200	0	90	290	0	25	125	40	0	25	65	60
1978	200	50	110	360	15	25	140	40	15	25	80	60
1980	0	100	50	150	30	15	45	0	30	15	45	0
1985	0	100	50	150	30	15	45	0	30	15	45	0
1990	0	100	50	150	30	15	45	0	30	15	45	0
1995	0	100	50	150	30	15	45	0	30	15	45	0

* Complete listing is given in Appendix F.

** Rounded to the nearest 5.

TABLE 2

**POPULATION ALLOCATED TO COMMUNITIES
BY SELECTED FORECASTS AND YEARS***

	1976	1978	1980	1985	1990	1995
<i>Forecast 1: Filed letters of intent with BLM</i>						
Craig	4,175	3,550	4,250	4,115	4,150	4,160
Meeker	170	315	910	590	575	570
Hayden	205	230	395	380	370	370
Scattered**	110	395	1,465	775	760	760
Total	4,660	4,450	7,020	5,860	5,860	5,860
<i>Forecast 2: Possible development which may occur after 1980</i>						
Craig	615	240	90	665	1,165	1,285
Meeker	30	20	0	95	110	100
Hayden	30	15	120	465	680	705
Scattered	15	15	10	85	105	100
Total	690	300	220	1,310	2,060	2,190
<i>Forecast 3: Combination of Forecast 1 and 2</i>						
Craig	4,795	3,790	4,335	4,870	5,485	5,665
Meeker	200	335	860	620	615	590
Hayden	235	245	845	935	1,075	1,085
Scattered	125	420	1,400	745	745	715
Total	5,350	4,750	7,240	7,170	7,920	8,050
<i>Forecast 3: Combination of Forecast 1 and 2 with development of new town</i>						
Craig	3,795	2,390	2,930	2,700	3,210	3,355
Meeker	30	345	525	220	225	220
Hayden	90	200	620	825	985	1,000
New Town	1,390	1,540	2,130	2,950	3,050	3,015
Scattered	45	270	1,030	465	450	460
Total***	5,350	4,750	7,240	7,170	7,920	8,050
<i>Forecast 5: All possible development including oil shale impacts</i>						
Craig	4,905	9,500	7,260	4,380	4,765	4,960
Meeker	165	3,370	8,680	15,170	14,983	14,835
Hayden	180	430	505	870	985	1,010
Scattered	100	3,975	4,240	1,140	1,073	1,040
Total	5,350	17,270	20,690	21,560	21,810	21,840
<i>Forecast 5: All possible development including oil shale impacts with new town</i>						
Craig	3,785	5,760	4,580	4,135	4,540	4,750
Meeker	20	1,985	4,040	6,600	6,670	6,750
Hayden	100	320	510	820	804	925
New Town	1,421	6,520	8,860	8,410	8,155	7,550
Scattered	25	2,680	2,965	1,595	1,515	1,460
Total	5,350	17,270	20,690	21,560	21,810	21,840
<i>Forecast 6: Colowyo Mine Development</i>						
Craig	240	805	935	940	940	940
Meeker	645	200	220	220	220	220
Hayden	20	55	65	60	60	60
Scattered	5	30	35	35	35	35
Total	910	1,090	1,250	1,250	1,250	1,250
<i>Forecast 7: Railroad Development</i>						
Craig	205	250	100	100	100	100
Meeker	50	60	25	25	25	25
Hayden	15	20	10	10	10	10
Scattered	20	30	15	15	15	15
Total	290	360	150	150	150	150

* Allocation of population was made assuming no restraints to development within the listed communities.

** Scattered refers to population which is drawn to Steamboat Springs, Rangely and Rifle.

*** Some variance in totals are due to rounding.

TABLE 3

**NUMBER OF HOUSING BY TYPE FOR
SELECTED FORECASTS BY SELECT YEARS***

	1976	1978	1980	1985	1990	1995
<i>Forecast 1: Filed letters of intent with BLM</i>						
Single Family**	680	650	1,010	840	840	840
Multi-Family	425	365	550	410	410	410
Mobile Home	775	570	830	425	425	425
Total	1,880	1,585	2,390	1,675	1,675	1,675
<i>Forecast 2: Possible development which may occur after 1980</i>						
Single Family	95	45	35	195	295	315
Multi-Family	55	25	15	90	145	155
Mobile Home	65	35	15	90	150	155
Total	215	105	65	375	590	625
<i>Forecast 3: Combination of Forecast 1 and 2</i>						
Single Family	780	690	1,050	1,025	1,135	1,150
Multi-Family	470	390	580	515	565	575
Mobile Home	845	605	830	510	565	575
Total	2,095	1,685	2,460	2,050	2,265	2,300
<i>Forecast 5: All possible development including oil shale impacts</i>						
Single Family	780	2,540	3,125	3,020	3,110	3,120
Multi-Family	470	1,560	1,665	1,510	1,560	1,560
Mobile Home	845	2,945	2,135	1,515	1,560	1,560
Total	2,095	7,045	6,925	6,045	6,230	6,240
<i>Forecast 6: Colowyo Mine development</i>						
Single Family	135	160	180	180	180	180
Multi-Family	50	75	90	90	90	90
Mobile Home	120	75	90	90	90	90
Total	305	310	360	360	360	360
<i>Forecast 7: Railroad development</i>						
Single Family	40	50	25	25	25	25
Multi-Family	5	10	10	10	10	10
Mobile Home	80	80	10	10	10	10
Total	125	140	45	45	45	45

* Housing needs by employment sector by year are given in Appendix F.

** Rounded to the nearest 5.

c. Hayden

There are no homes for sale or rent; there are however, a few mobile home spaces available. There is one 22 unit single-family development under construction and two proposed subdivisions which could supply, at a minimum, an additional 680 units; none of which could supply, at a minimum, an additional 680 units; none of which are mobile home units. The city of Hayden is generally opposed to mobile home units (see Appendix E).

8. PUBLIC SERVICES AND UTILITIES

a. Craig

Craig is in a relatively good position in terms of public services compared with Hayden and Meeker. The water supply is adequate to accommodate an additional 22,000 people; the treatment plant can absorb an additional 4,000 people; and the distribution system is being repaired so that future needs can be met by extending lines to new areas. Although the sewage treatment plant is at capacity, it is being improved, and when work is completed it will be capable of serving a population increase of 9,000. The landfill is sufficient for five more years and an increase of 25,000 persons. If the town acquires more doctors, the hospital facilities will be able to serve an additional 5,600 persons.

School facilities are at capacity, and recreation and police facilities are presently over capacity. The fire department will require expansion, particularly if growth takes the form of apartment construction and trailer courts.

With the addition of one or two schools and by increasing the police department's capabilities, the town's facilities could accommodate an additional 4,000 people. This may allow enough lead-time for expanding other facilities to meet additional population growth.

b. Meeker

Meeker's facilities are adequate to meet the needs of its present population, but have very little excess capacity.

The schools can accommodate a population increase of approximately 500 people. The hospital facilities can absorb an increase of 3,881 people if more doctors are acquired. Recreation facilities can also accommodate a population growth of about 500.

Other facilities are presently slightly over capacity including water and sewer which are the most critical services.

In anticipation of population growth, the town has contracted engineering studies for the expansion of water and sewer facilities, and the school board has prepared plans for expansion. None of the work has yet been funded, however.

The plans for the water treatment plant call for an expansion which would serve an additional 1,900 people at completion of Phase I and another 3,900 at the completion of Phase II, for a total increase in capacity capable of serving 5,800 more people.

Presently the town is not equipped to absorb additional populations adequately. If the water, sewer and school plans are funded and implemented, the town will be just barely able to accommodate a population growth of 2,000 to 4,000. Police, fire, recreation and library facilities must also be expanded.

c. Hayden

Hayden's facilities do not have excess capacities.

Although no plans have been made to expand the water treatment plant, the replacement of the filter system and acquisition of additional storage would enable the plant to serve 1800 more people. The sewer treatment plant will be able to accommodate another 500 people when the defective collection pipes are replaced.

The schools can facilitate approximately 50 more elementary students and 25 to 50 more junior and senior high students. The school board has discussed building either a new elementary or middle school but no definite plans have been made.

The police, fire, solid waste disposal and recreation facilities would also need to be expanded in order to handle any population increase.

Hayden's medical facilities will probably be adequate since Craig is only a 15-minute drive away, and ambulance service is available.

9. ATTITUDES AND OPINIONS

The following are the general results of the Craig and Meeker surveys; the Craig survey was conducted by VTN,

the Meeker survey by Moffat County.

a. Craig

The majority of those sampled are willing to see growth occur provided that it does not exceed 8,000 persons in the City of Craig, does not exceed 15,000 persons in the county, and the growth is adequately planned to take care of the needs of the population.

The sample also felt that growth problems were handled poorly in the past. When asked who should pay for growth needs the respondents ranked the following in order of responsibility for growth: industry, developer, incoming population, merchants, existing population.

Thirty-seven percent of the population thought growth should occur in existing towns; and one in five respondents thought the growth should occur in new towns.

b. Meeker

The results of the Meeker survey were similar to the Craig survey except in location of growth. Those respondents who are willing to see Meeker grow indicated a maximum desirable growth of an additional 2,000 persons. Meeker respondents were very favorable to new towns, especially to facilitate mineral developments.

B. SUMMARY OF THE RESULTS OF THE COMPOSITE MAPPING PROCESS

1. MACRO-SITE SELECTION

During the macro-site selection process, the Study Area was inventoried and mapped. Constraints to development were identified as well as features suitable for development. Areas exhibiting these constraints, designated as red-flagged areas, were deleted from further consideration. See Figures 7 and 8. Constraint and suitability features were then compiled using computer-assisted composite mapping techniques (see Section III, Part A.) The composite mapping process delineated eleven areas suitable for possible community development which are delineated on Figure 9. Of these eleven areas, numbered 3 through 13 on Figure 9, six areas were

chosen for micro-site analysis; these are areas numbered 3 through 9. The remaining areas were deleted either because of their distance away from major highway networks or because there were major development problems (see Section III, Part E). In addition the communities of Craig and Meeker were added as areas for micro-site analysis, areas numbered 1 and 2 on Figure 9.

2. MICRO-SITE ANALYSIS

When the population forecasting and housing demand was applied to the area selection process, several types of housing needs became apparent:

- Short-term: Housing for employees coming into the study area in the next two years (1976 and 1977), excluding oil shale development.
- Long-term: Housing to accommodate the population growth forecast for the next eight years, including oil shale development.
- Long-term: Planning for population generated if current trends continue, i.e., a possible new town.

Housing for Colowyo Mine employees fell within the first category of housing needs. If development of the Colowyo Mine occurs as projected, housing will be needed by the middle of 1976. This need was given first priority with all other housing needs assigned second priority.

3. SITE SELECTION FOR SHORT-TERM NEEDS

Of the eight areas, two were suitable for short-term housing needs since they were located next to developed areas with community facilities. These were in the Craig and Meeker areas. These two areas were evaluated in more detail to estimate the costs of development. In addition, the communities of Craig and Meeker were evaluated to see if other small sites were available for multi-unit developments.

Meeker is currently planning the growth of the city in a northerly direction due to the highly productive crop yield of the land on the remaining three sides of the city. Every effort is being made by the city and county to discourage growth in those three directions.

The water system is presently at capacity and no additional demands on this system will be allowed until the system is expanded. The sewage treatment system is near capacity. An extensive offsite trunk sewer will have to be constructed.

At this time, the city is applying for state and federal grants to extend the water and sewer systems. Without these grants, the costs will have to be borne by the developer. Basic costs per unit for a 400-unit development, assuming a 1,000 square foot house at \$30 per square foot, equals \$38,172 without water and sewer system costs. With water, costs per unit equalled \$41,151; with water and sewer, the units cost rises to \$43,525. It is apparent that a great deal of time will be required to determine if the grants and subsequent construction will occur. If it does not, additional time would be needed for further study; thus, time as well as costs are a limiting factor.

It is possible for a private firm to underwrite or guarantee the city's cost; however, this alternative would also have to be thoroughly evaluated. Development of this area in Meeker would not be feasible for immediate housing needs.

a. Development Possibilities within the City of Craig

There are several good opportunities for housing for Colowyo Mine and other mineral-related employers within the city of Craig. There are several parcels suitable for single family housing development. Costs for development of a house in Craig, assuming \$30.00 a square foot and a 1,000-square-foot house with utilities, would be approximately \$31,000, provided that the housing development could tap into the existing water and sewer systems.

There is also a demand for apartments to house singles, couples, and temporary construction families. This demand has been substantiated in an unpublished report prepared by the Department of Housing and Urban Development. This agency is in the process of studying the possibilities of recommending to FHA that funds be allocated to guarantee loans to developers planning apartments and other related projects for the provision of temporary housing facilities. Recommendations should be made by the end of the year.

There are several areas in Craig that are suitable for development of an approximate 40-unit apartment complex. These sites are situated in town with no apparent problems concerning the utility system, zoning, or construction. An apartment unit can be constructed and ready for occupancy by the

spring of 1976. Interest in apartments in Craig is evidenced by the 100 percent occupancy status of an apartment complex which does not appear to be well engineered. Rents for these units are high, averaging \$250 a month. Many of these apartments have been rented by local townspeople.

b. Mine Site Development Possibilities

The establishment of temporary housing on the mine site is an alternative, although not a favored one. It offers benefits as well as detriments. It establishes housing near the mine site, usually in the form of pre-fabricated modules or trailers. Its feasibility will depend on county regulations and zoning variances, however. This alternative is beneficial in that it provides housing for short-term employees and it decreases the housing vacancies caused in towns when construction employees leave (better known as the peaks and valleys syndrome). The detriments of on-site housing are mainly affecting the employees themselves; lack of social interaction with other non-company people, no close community facilities, resulting in constant commuting, no recreational facilities, and other social problems. This alternative should be considered only if no other solution to the housing problem is found.

4. SITE SELECTION FOR LONG-TERM NEEDS

Site selection will be easier to assess, mainly because there is more time to evaluate and plan for the community needs for incoming population several years in advance. The six areas chosen by the computer mapping process are applicable to long-term growth needs. There are several types of new community developments, including the following:

- Free-standing communities or new towns which are totally self-supporting
- Satellite communities with densities of approximately 5 to 15 persons per acre which use services of an adjacent community
- Towns within towns or the revitalization of an older section of town
- Company towns or "energy new towns" which are located near natural resources

- Planned unit developments (PUD) which are subportions of the larger new community which utilize new and existing community services
- Recreation-oriented new town located in close proximity to a recreational amenity (such as a lake, ski area, etc.)

There are five areas that can be considered for a new town, company town, energy new town, or a recreation-oriented new town. All five of these areas warrant consideration if and when there is enough population to support a new community (i.e., if all projects develop as planned).

a. Maybell Area (Site 3 on Figure 9)

Maybell has the potential for being considered as a new town if a varied employment base can be provided. Coal development alone will not be able to sustain it. Should Union Pacific Railroad consider extending a line near Maybell, it may attract a more heterogenous employment base.

b. Jesse Gulch, Morgan Gulch and Axial Areas (Sites 4, 5 and 6, respectively, on Figure 9)

These three sites have the potential to be developed as a new town, company town, energy new town or a recreation-oriented new town. These sites offer diversity, general recreation-oriented amenities and good location relative to both Craig, Meeker, Juniper Reservoir and the Colowyo Mine.

These sites should be considered for future development, and when applicable, cost and facility studies should be undertaken to assure proper planning.

c. Sand Spring and West Craig Areas (Sites 7 and 8 on Figure 9):

The Sand Spring area has the potential of becoming recreation-oriented community due to its location in proximity to the Yampa River and the proposed Juniper Reservoir area. Its major problem is one of access; at present the only access is from Highway 40. It can be connected to Highway 13 by building a bridge across the Yampa River. Both Sand Spring and West Craig have the potential of become-

ing satellite communities because they are located near the City of Craig. The factor limiting immediate development is provision of municipal utilities. The costs involved for construction of utilities by the developer and the location of these sites in close proximity to Craig may preclude the installation of independent utility systems.

C. RECOMMENDATIONS

By developing the Colowyo Coal Mine, W. R. Grace & Co. will be responsible for a portion of the cumulative growth impact to the communities of either Meeker or Craig or perhaps both. VTN therefore recommends the following:

1. Because of the "short-term" needs of the projected incoming population resulting from Colowyo mine development, it is recommended that encouragement be given to developing the remaining developable sections within either Meeker or Craig, depending upon which is more viable in terms of utility costs.

2. It is recommended that no satellite or new town be considered at present because of the costs involved and the lack of a mixed employment base. Also, this alternative would not solve the current housing needs. Development such as this, however, warrants consideration to facilitate future growth. If this is considered, it is recommended that land options be considered as soon as possible. *Where is your analysis of financial feasibility?*

3. It is recommended that members of the W. R. Grace & Co. management team become involved with the communities of Craig and Meeker.

4. It is strongly recommended that W. R. Grace & Co. assist in the community planning process in order that the consequences of rapid growth can be minimized. Both the communities of Craig and Meeker and Moffat and Rio Blanco Counties have opted for HB 1041 funds which states that they will comply with the state requirements for an environmental master plan. Any environmental information or other assistance that W. R. Grace & Co. can provide will reduce city and county expenditure as well as expedite financial and legislative procedures.

It should be noted that the information contained in this report will provide direct aid to the community planning processes.

5. Consideration should be given to methods for establishing funds for the provision of community services. VTN recommends that an investigation be conducted assessing the availability of funding from private, state and federal agencies. Often communities are not aware of funds which are available for provision of community services to growth areas.

6. It is recommended that, prior to any development, those involved should become familiar with all State, County, and local legislation related to community development.

III. REGIONAL AND AREA SPECIFIC PHYSICAL CHARACTERISTICS

A. COMPUTER MAPPING PROCESS

1. DATA COLLECTION AND COMPUTERIZATION

Once the methodology and basic parameters of the study had been determined, as described in Section I, an inventory of the pertinent data was carried out. The initial phase of the inventory involved identification of unified data. This refers to data that have been generated, standardized, and compiled on a regional or statewide scale. The resources collected during this phase included topical maps and published and unpublished data bases. These were collected from several sources including federal agencies, state and county commissions, local governments, personal interviews, and related documents from other planning studies.

Since the study was based on a geographical approach, it was necessary to collect all pertinent maps to establish as much spatial information as possible. Five federal agencies provided maps used in the spatial analysis of environmental and land base data: the Bureau of Land Management (BLM), U.S. Forest Service (USFS), Bureau of Reclamation (BR), Soil Conservation Service (SCS), and U.S. Geological Survey (USGS). Appendix A, Part I, contains a listing of maps supplied by these agencies.

The Colorado State Land Use Commission provided statewide maps covering such topics as general land use, energy resources, agricultural potential, total winter snow depth, groundwater availability, irrigated lands, etc. Colorado State Highway Department maps for Moffat, Routt, and Rio Blanco counties were used to form the regional base map.

VTN personnel developed maps for specific disciplines to be used in the spatial analysis. These maps dealt with groundwater availability, surficial geology, air dispersion and movement, and land ownership. Four wildlife impact maps were developed for avian, aquatic, big game, and small game biologic resources. These maps are available separately from this report. In addition, several Colorado state agencies were contacted during the collection of data. These included the Land Use Commission, State Employment Service, State Department of Agriculture, State Geological Survey, Public Utilities Commission, Division of Water Resources, Recreation Commission, and Game and Fish Department.

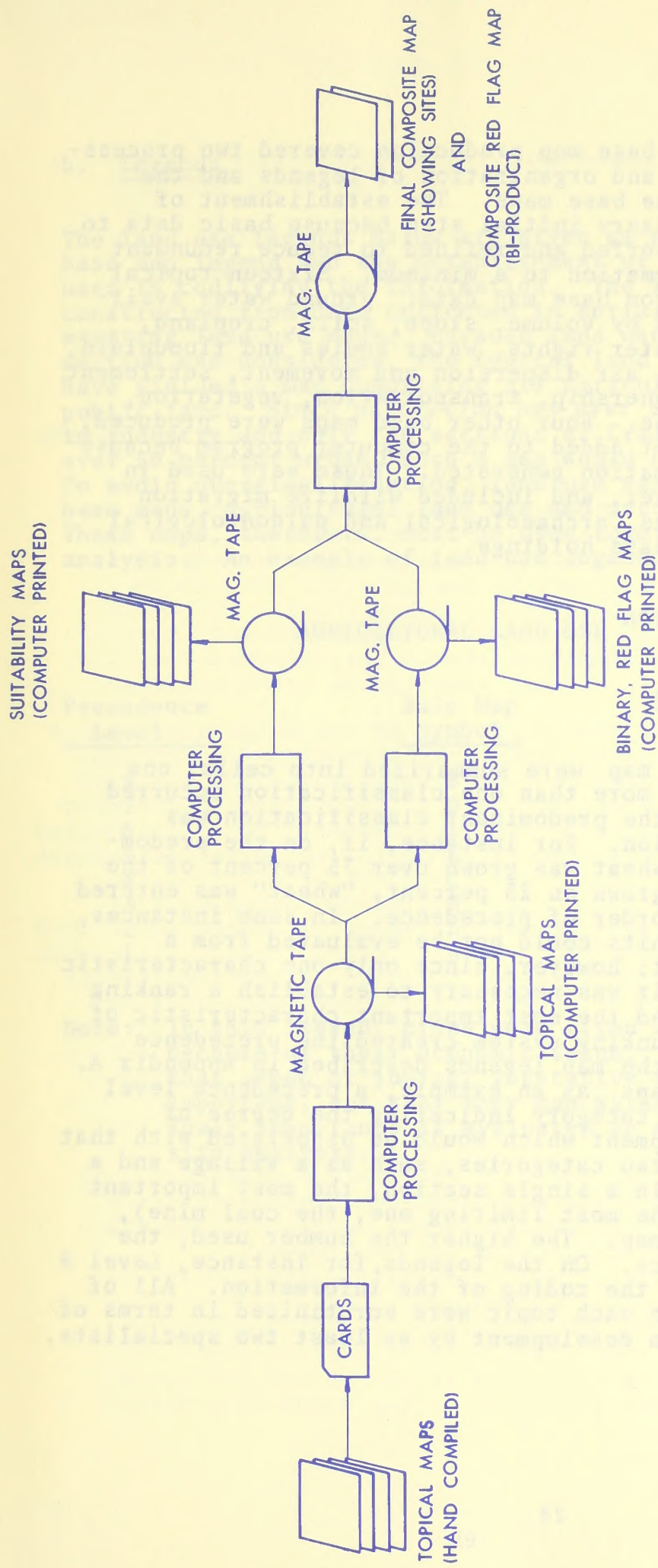
Land use and general topographic information in the study area was collected and recorded through an airborne survey. This technique was selected because review of the currently available data for the study area revealed a lack of adequate, up-to-date information on land use, topographic limitations, and cultural features. Although air photos and topographic quadrangles were available, they could not supply adequate data within the desired time frame. The aerial survey was judged most appropriate for the following reasons:

- Visual observation of the entire study area would provide a sound base of primary data while allowing for an update of existing land use maps
- Current migration routes and browsing areas of large game could be traced and identified
- A first-hand knowledge of land use patterns for the region as a whole could be acquired by this means. This was later found to be a highly significant factor in making decisions during the cellular mapping process (described below)

Subsequent to the completion of the data collection, post-flight field checks were conducted in several key areas. These on-site observations proved useful as a means of spot-checking the accuracy of the aerial technique, gathering specific data in complex areas where further information was deemed necessary, and aiding in the overall familiarization with and perception of the area.

When these maps were collected and duplicate information removed, the information they contained was coded for computer processing purposes using the cellular mapping process. Through this method, all information was tabulated by topic on the basis of one-square mile sections. Each section represented one-square mile or one-half mile to the inch, corresponding exactly to a computer printer character matrix of five columns by four rows. This allowed the information to be synthesized efficiently in various ways without a laborious, time-consuming overlay process. This coded information was then entered into the computer for base map preparation and subsequent analysis.

The analysis involved three basic steps: the production of base maps, the coding and creation of computerized topical maps, and the arithmetic manipulation and compositing of the maps. Although overall control and organization were exercised over the entire sequence, each phase was developed with attention given to its own unique problems and attributes. The complete computer mapping process is given in Figure 5.



COMPUTER COMPOSITING AND MAPPING PROCESS

FIGURE 5

The initial phase of base map production covered two processes: the development and organization of legends and the actual creation of the base maps. The establishment of legends was the necessary initial step because basic data to be mapped had to be sorted and refined to reduce redundant and superfluous information to a minimum. Sixteen topical maps were produced from base map data: ground water availability, water rights by volume, slope, soils, cropland, surficial geology, water rights, water bodies and floodplain, predominant land use, air dispersion and movement, settlement and industry, land ownership, transportation, vegetation, minerals, and wildlife. Four other base maps were produced, although they were not added to the computer program because of the type of information generated. These were used in area selection, however, and included wildlife migration routes, historic sites, archaeological and paleontological sites, and mineral lease holdings.

2. BASE MAP PRODUCTION

a. Precedence Levels

Data from each topic map were summarized into cells, one section in size. If more than one classification occurred in a given section, the predominant classification was entered for the section. For instance, if, on the predominant land use map, wheat was grown over 75 percent of the section and hay was grown on 25 percent, "wheat" was entered for that section by order of precedence. In some instances, the classification units could not be evaluated from a percentage standpoint; however, since only one characteristic could be displayed, it was necessary to establish a ranking system which preserved the most important characteristic of the section. This ranking system created the precedence levels displayed on the map legends described in Appendix A. Using the land use maps as an example, a precedence level was assigned to each category indicating the degree of limitation to development which would be associated with that particular use. If two categories, such as a village and a coal mine, occurred in a single section, the most important one (in this case, the most limiting one, the coal mine), would appear on the map. The higher the number used, the greater the precedence. On the legends, for instance, Level 8 outweighs Level 1 in the coding of the information. All of the categories within each topic were scrutinized in terms of suitability for urban development by at least two specialists.

b. Legends

The land use legends below are given as an example of the base map legend and the establishment of precedence level used in codifying the information. The land use maps were constructed from data collected in aerial reconnaissance and existing land use maps. Because land use of an entire section was considered, the typical land use categories would have yielded a map comprising all agriculture, forestry, and public land. Since no section has over 50 percent of its land in industry and only the sections of Craig and Meeker are over 50 percent urban, such a map would have been misleading. To avoid oversimplification, land use was divided into two base maps, agricultural land use and settlement and industry. These maps, therefore, must be used together for land use analysis. An example of land use legends follows:

AGRICULTURAL LAND USE

<u>Precedence Level</u>	<u>Base Map Symbol</u>	<u>Land Use Category</u>
8	B	Wheat
7	D	Hay
6	I	Mixed Conifer
5	K	Aspen
4	C	Improved Range
3	H	Oak Scrub
2	E	Juniper
1	A	Sagebrush

Note: In this legend, crops were given higher precedence because of their economic value. That is not to say that aspen or juniper vegetative areas are not important, but that they can withstand human occupancy. Their importance is evaluated in more detail in micro-site analysis.

SETTLEMENT AND INDUSTRY LAND USE

<u>Precedence Level</u>	<u>Base Map Symbol</u>	<u>Land Use Category</u>
6	1	Industry
5	2	Oil/Gas Extraction
4	3	Coal Mining
3	4	Open Pit
2	5	Urban Area
1	6	Dispersed Settlement and Farms

The legends for the base maps, which are the same for the topical maps, are contained in Appendix A, Part II. The base maps and topical maps are available separately from this report.

3. TOPICAL MAP PRODUCTION

After the base maps were prepared, it was necessary to convert sectional data into point position data for the composite mapping system. All data were coded from the base map onto an overlay and key punched directly from the overlay. Data was constantly checked, and errors were corrected throughout the coding process and prior to formal data input.

Following the creation of the initial Composite Mapping System (CMS) data file, a first view of the computer-printed topical maps was obtained. At this stage, almost all errors in coding had been eliminated; however, an additional edit was performed and the few remaining errors corrected on revised topical maps.

4. SUITABILITY MAP PRODUCTION

Following topical map input, a series of suitability maps were constructed. These maps analyzed whether or not a certain topical characteristic would render a particular section suitable or unsuitable for development.

Four suitability rankings were incorporated into the program. They are as follows:

<u>Ranking</u>	<u>Weight</u>
Most Suitable	3
Suitable	2
Least Suitable	1
Red Flag	0

These suitability rankings take into consideration whether or not a physical characteristic will negate development; for example, development should not occur where there is a physical impediment, i.e., a large water body or a wilderness area where the land is protected by law. The rankings also consider the existing use of the land and its economic potential. For instance, land held under mineral lease should not be considered for development purposes. Current high yield cropland should also not be considered as a potential community development area.

A "most suitable" ranking was reserved for characteristics constituting optimal developmental conditions with no limitations. This ranking was also given to such favorable aspects for development as a substantial water supply. Sections containing features offering severe constraints to development were given a "red flag" ranking. Six legends had categories of characteristics that were sufficiently limiting to require red flagging. These were land use, minerals, ownership, settlement, industry, slope, and water bodies.

The "suitable" and "least suitable" rankings indicate that while there are some impediments to community development, they can be mitigated but may require costly alterations. The difference between these rankings is the degree of the characteristic. For example, lack of water availability on or near the site may require piping in a water supply and, depending upon the location of the water source and the intervening topography, the cost of this mitigation may or may not be prohibitive. Table 4 gives the developmental suitability rankings as they correspond to map codes. Table 5 traces the suitability composite mapping process.

Six of the suitability maps originated from a single data base: soils. This represented a standard legend category regrouping based on published USDA guidelines. Because the Soils Conservation Service (SCS) does not identify any soil characteristic levels as not developable, no red flags were assigned to these maps. Following the legend analysis, the

DEVELOPMENTAL SUITABILITY RANKING*

TABLE 4

SUITABILITY CATEGORY	MOST SUITABLE	SUITABLE	LEAST SUITABLE	RED FLAG
CROPLAND	A1J	B2KNC3	LPSD4MQTW	NONE
GROUND WATER AVAILABILITY	54	3	21	NONE
LAND USE	AC	BD	NONE	EHKI
MINERALS	V	RH	IEXC	BAS
OWNERSHIP	9	NONE	876	54321
SETTLEMENT INDUSTRY	NONE	652	1	34
SLOPES	A	BC	D	QE
WATER BODIES	B	A	NONE	C
** DWELLINGS W/O BASEMENTS	DW	CX	BAEHJKLMPRSTVZ	NONE
** FROST POTENTIAL	ABCWV	DEJKIMSX	HIPRTZ	NONE
** ROAD FILL	W	CD	XBJAEHIJKLMPRSTVZ	NONE
** SEPTIC TANK	CW	DX	BAEHJKLMPRSTVZ	NONE
** SEWAGE LAGOONS	NONE	CDIL	BMAEHJKWPRSTVXZ	NONE
** SHRINK SWELL	ADJKWX	BCEH	SILMPRTVZ	NONE

* NUMBERS AND LETTERS IN TABLE REFER TO THE MAP LEGENDS GIVEN IN APPENDIX A, PART II.

** LOGICALLY DERIVED FROM SOILS BASE MAP.

SOURCE: VTN

TABLE 5
RESULTS OF TOPICAL MAP PROCESSING

Topical Maps (.)		Suitability Maps (S)		Red Flag (Binary) Maps (X)	Final Composite Red Flag Maps + Suitability Maps
Air Dispersion *		-----			
Cropland	→	Cropland			S
Geology *		-----			
Ground Water		Ground Water			
Availability	→	Availability			
Land Use	→	Land Use	→	Land Use	S+X
Minerals	→	Minerals	→	Minerals	S+X
Ownership	→	Ownership	→	Ownership	S+X
Settlement/		Settlement/		Settlement/	
Industry	→	Industry	→	Industry	S+X
Slopes	→	Slopes	→	Slopes	S+X
Soils	→	Dwellings			
(Six logically		With/Without			
derived maps		Basements			S
produced from	→	Frost Potential			S
soil data base)	→	Road Fill			S
	→	Septic Tank			S
	→	Sewage Lagoon			S
	→	Shrink Swell			S
Transportation *		-----			
Vegetation *		-----			
Wildlife *		-----			
Water Bodies	→	Water Bodies	→	Water Bodies	S+X
Water Rights					
Type *		-----			
Water Rights		Water Rights			
Volume	→	Volume			S

→ means produced.

* Not included in final composite (see text).

suitability map and data bases were created by the computer (see Figure 5).

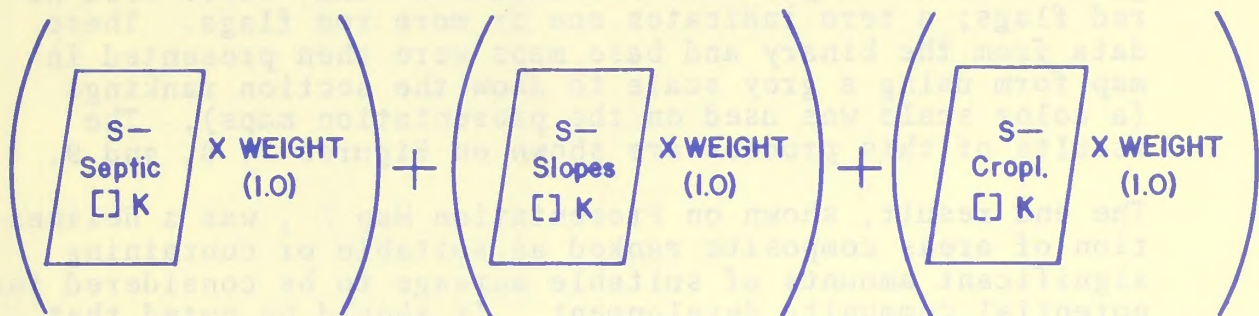
After a detailed examination of the significance of each map and its legend, it was determined that five of the original topical maps would not be useful for inclusion in the final composite. Air dispersion was omitted because of a lack of detailed data. Geology, normally relevant, was omitted because of the absence of active faults and critical bed-rock problems. Also, the minerals and soils base maps contained much more useful information related to geology. Transportation was also eliminated because access in the region is relatively uniform and because it is not an economically limiting factor. To reduce redundancy, the vegetation map was removed because of its similarity to the land use map. Similarly, the water rights location map was removed because the essential information (potential water supply availability) was duplicated on the water rights volume map.

5. BINARY MAP PRODUCTION

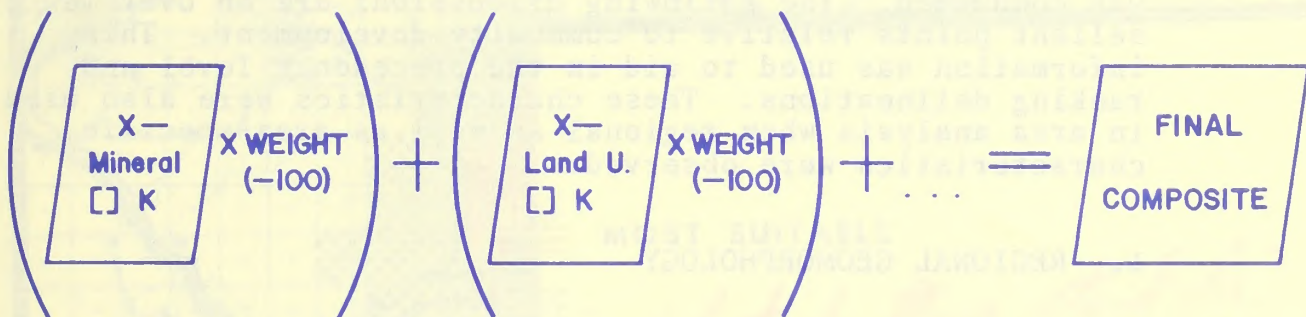
One binary map was made showing only red-flagged areas. This was the first composite map produced by combining all relevant topical information. In the computer input for these maps, a binary coding system was used. Red-flagged areas appearing on topic maps were weighted with a 1; areas not red-flagged received a 0. This allowed sections having one or more red flags to remain red-flagged throughout the compositing process, regardless of any other suitability score that might be generated by other data for that particular section. Once a section was red-flagged, it was eliminated from consideration for community development.

6. COMPOSITE MAP PRODUCTION

The final step in the CMS analysis method was the total composite of all suitability and binary data bases into a map showing each section ranked according to the total score received from all maps. Figure 6 gives an example of the compositing process. In the figure, the score of the suitability for section "K" on the septic tank map shown as an example was multiplied by a weighting factor (1.0 in all cases) and added to the weighted score from the slope map which was added to the score from the cropland map, etc. until all suitability data bases had been employed. Next, this intermediate total score was added to the weighted red



+



X = RED FLAG MAP S = SUITABILITY MAP

THE COMPOSITE MAP PROCESS

FIGURE 6

flag score for each binary data base. In order to maintain the red flagging and not consider these areas in site selection, the section score on each binary map was multiplied by -100.0; thus, after adding the weighted score for each binary map to the intermediate total score from the suitability maps, a final total score was obtained. This score was scaled and ranked from zero to nine with any negative values given a zero. A positive sum indicates that there were no red flags; a zero indicates one or more red flags. These data from the binary and base maps were then presented in map form using a grey scale to show the section rankings (a color scale was used on the presentation maps). The results of this process are shown on Figures 7, 8, and 9.

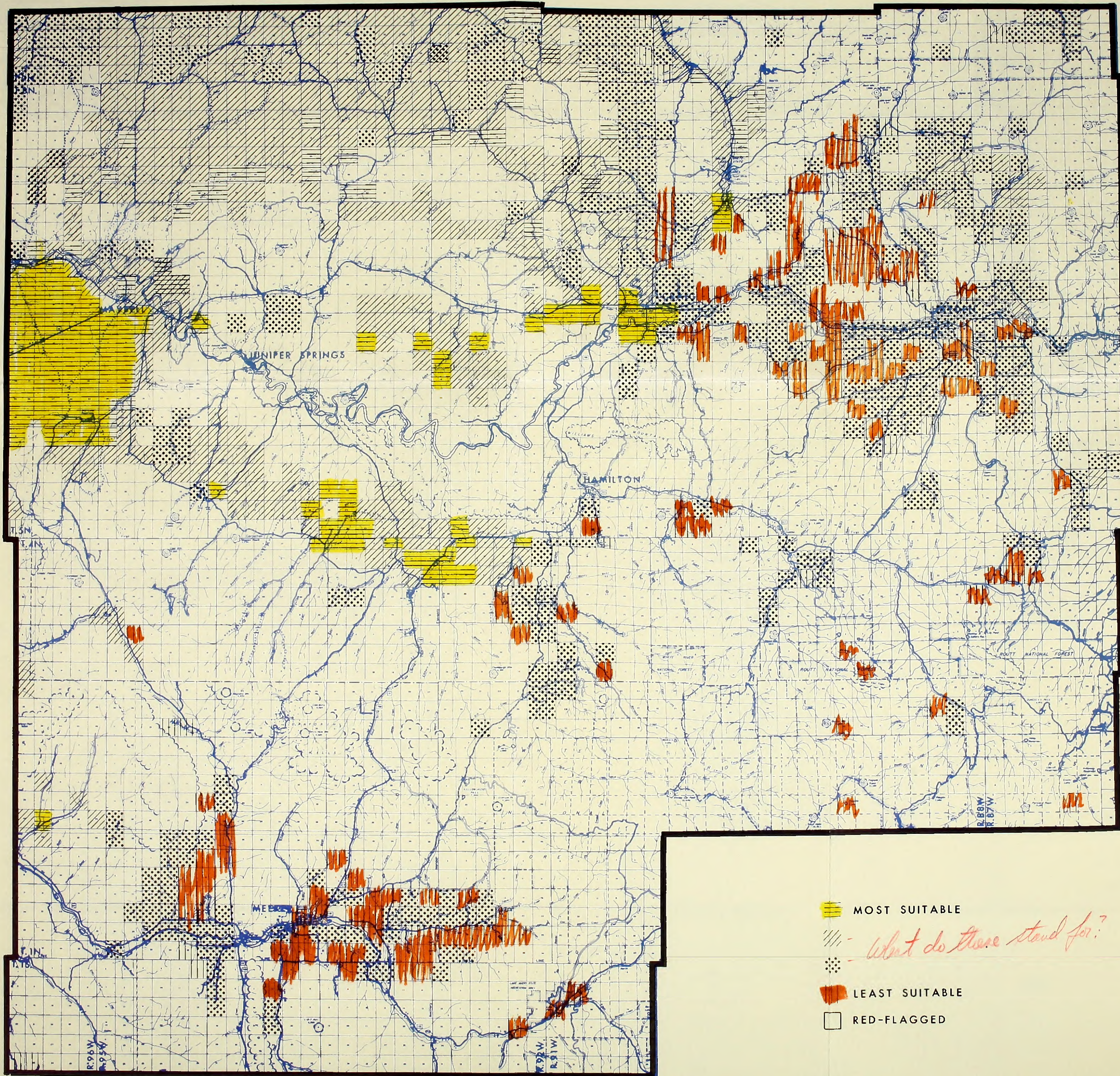
The end result, shown on Presentation Map 7, was a delineation of areas composite ranked as suitable or containing significant amounts of suitable acreage to be considered for potential community development. It should be noted that the site selection process was primarily oriented toward development of a possible free-standing community, rather than a development attached to an existing community.

B. REGIONAL PHYSICAL CHARACTERISTICS

In addition to the computer composite mapping process, a fatal flaw study of the regional physical characteristics was conducted. The following discussions are an overview of salient points relative to community development. This information was used to aid in the precedence level and ranking delineations. These characteristics were also used in area analysis when regional as well as area-specific characteristics were observed.

1. REGIONAL GEOMORPHOLOGY

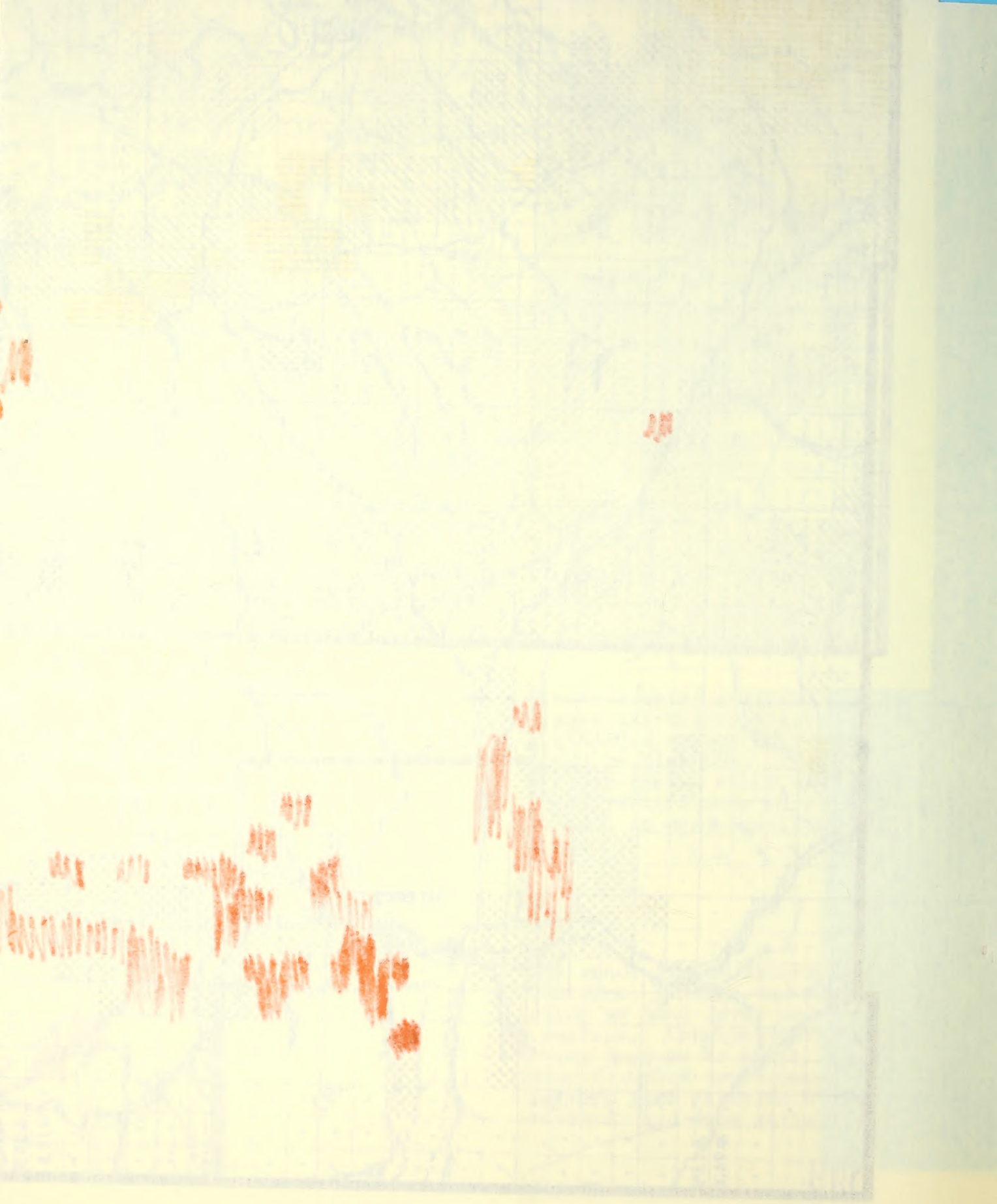
A survey of regional geomorphology requires the delineation of interrelationships between structure, process and form which dictate the areal distribution of land forms and geologic hazards at the earth's surface. Consideration of these parameters reveals the varying degrees to which surface geology acts as a moderator to urban development. Information for this study was derived from existing USGS reports and maps, from private studies, and from aerial reconnaissance.



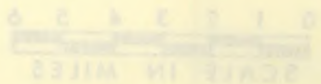
0 1 2 3 4 5 6
SCALE IN MILES

FINAL COMPOSITE MAP

FIGURE 7



PAMFIRBOO





AREA OF POSSIBLE DEVELOPMENT
ONLY DELINEATED BY A DOTTED LINE



a. Structure

The study area is located within the Wyoming Basin physiographic province on portions of the tectonic units of the Land Wash Basin, Axial Basin Uplift, and White River Uplift. The general topography of the Wyoming Basin province is typified by plateau areas underlain by relatively soft sedimentary rocks, isolated mountain ranges, and bordering steep mountain slopes. Specifically, the study area is characterized by intermediate to large scale northwest-trending folds and faults. Volcanic flows, dikes, rills, and plugs characterize the eastern portion of the study area, particularly in the northeast and southeast corners.

The surface geology is characterized by lithologic units of four eras. Tertiary rocks include those of the Browns Park, Green River, Wasatch, and Fort Union Formations. The lithology of these formations is described in Figure 10. While rocks of the Green River Formation are, as a whole, regularly thin-bedded and exhibit lateral persistence, member units of the Wasatch Formation are generally non-resistant, with the sandstones weathering to buff, brown, and reddish-brown ledges, and the shales weathering to steep red and gray slopes. There is little local evidence of erosion of the Fort Union Formation, while the semiconsolidated tuffaceous sand and gravel of the Browns Park Formation frequently weathers to unconsolidated white sand of Quaternary alluvium deposits.

Surface outcrops of Cretaceous units involve the Lance and Mancos Shales, the Dakota Sandstone, and the Mesaverde group. The Lance Formation exhibits no major erosional features. The Mancos Shale is quite expansive, as indicated by swelling at the surface of existing road cuts. This may constitute problems when constructing dwelling units. Natural slopes underlain by the Mancos Shale exhibit local shallow sliding and slumping on north-facing slopes. The Mesaverde group consists of the Iles Formation, the Williams Fork Formation and the Lewis Shale. The sandstone units of the Iles and Williams Fork Formation are quite resistant to erosion and are non-expansive. Normal mass wasting does occur where large blocks of sandstone have broken away from exposed ledges of the Iles and Williams Fork Formations as seen on the flanks of Mild Creek. The shale units of the Williams Fork Formation and the Lewis Shale are moderately expansive and subject to sliding and slumping. The Dakota Formation has a moderate to high erosion potential from pluvial processes because of its high content of unconsolidated mudstones and conglomerated sandstones.

GENERALIZED STRATIGRAPHIC COLUMN
IN VICINITY OF
MOUNT STREETER, MOFFAT COUNTY, COLORADO

ERA	PERIOD	TIME (x10 ⁶ yrs ago)	GROUP	FORMATION	MEMBER	SUMMARY LITHOLOGIC DESCRIPTION	APPROXIMATE THICKNESS IN FEET	
							UNIT	CUMULATIVE
MESOZOIC	Cretaceous	70	Mesa Verde Group	Williams Fork Formation		Alternating sandstone, sandy shale, carbonaceous shale, and coal beds; characterized by brick-red color.	1000	1000
				Iles Formation	Prout Creek SS member	Sandstone, white, fine-grained, well sorted, massive, fairly uniform in thickness.	100	1100
						Alternating beds of massive sandstone and sandy or carbonaceous shale; light brown to white, poorly sorted, generally calcareous, grades into coal.	1300	2400
				Mancos Shale		Clay shale; soft dark-gray to drab, with lenses and interbeds of sandstone as much as 75 feet thick. Basal unit of bluish and dark-gray slaty shale and calcareous sandstone.	5600	8000
				Dakota Sandstone (?)		Quartzitic sandstone; thinly banded greenish-gray, with pebbles at the base.	260	8260
	Jurassic	unconformity	San Rafael Group	Morrison Formation		Shale, limestone, chert, conglomerate lenses, and sandstone; green, greenish-gray, varicolored and maroon.	400	8660
				Curtis Formation		Shale, glauconite sandstone and thin beds of glauconitic limestone, locally oolitic, thinly-bedded, gray.	40	8700
				Entrada Formation		Sandstone, massive beds, fine-grained, sugary, light gray.	400	9100
	Triassic	unconformity		Chinle Formation		Calcareous shale, mudstone and a few sandstone and limestone pellet conglomerate beds.	350	9450
				Shinarump Conglomerate		Sandstone and conglomerate interbedded, lenticular beds and steeply crossbedded, red.	50	9500
				Moenkopi Formation		Siltstone, shale; greenish-gray and gray, with thin red colored beds.	600	10100
PALEOZOIC	Permian	225		Phosphoria Formation		Calcareous shale to sandstone, limestone, and chert with concretions.	100	10200
	Pennsylvanian	270		Weber Sandstone		Calcareous sandstone; massive, light gray to buff, fine-grained.	250	10450
				Maroon Formation		Shale, sandstone, and limestone; red, interbedded.	1150	11600
				Paradox Formation		Gypsum, dark shale, yellow sandstone, red shale and siltstone; thick beds.	650	12250
	Mississippian	unconformity		Morgan Formation		Cherty sandstone, shale and limestone.	1750	14000
				Molas (?)		Basal red shale of Morgan Formation.	50	14050
				Madison Limestone		Cherty dolomitic limestone and dolomite; light and dark gray.	430	14480
	? - ?	350?		Beds of undetermined age		Interbedded shale sandstone, limestone and dolomite.	200	14680
	Cambrian	unconformity						
				Sawatch Quartzite		Dolomitic quartzite to quartzose sandstone; dark to very light brown and gray, locally crossbedded.	?	?
		570						



GENERALIZED STRATIGRAPHIC COLUMN

FIGURE 10

SOURCES: HANCOCK, 1925; KONISHI, 1959; THOMAS ET AL, 1945; HALLGARTH, 1959.

Rocks of the Jurassic-Triassic periods and Paleozoic era are composed of sandstones, mudstones, shale, limestones, and conglomerates, occurring less prevalently as a surface feature other than outcrops in the south-central portion of the study area. These formations exhibit differential weathering where exposed, although they are protected in the main by forested vegetative cover. The principal erosion potential arises through exposure of lenticular sandstone beds and from road cuts associated with oil and gas exploration on north-facing slopes.

b. Process

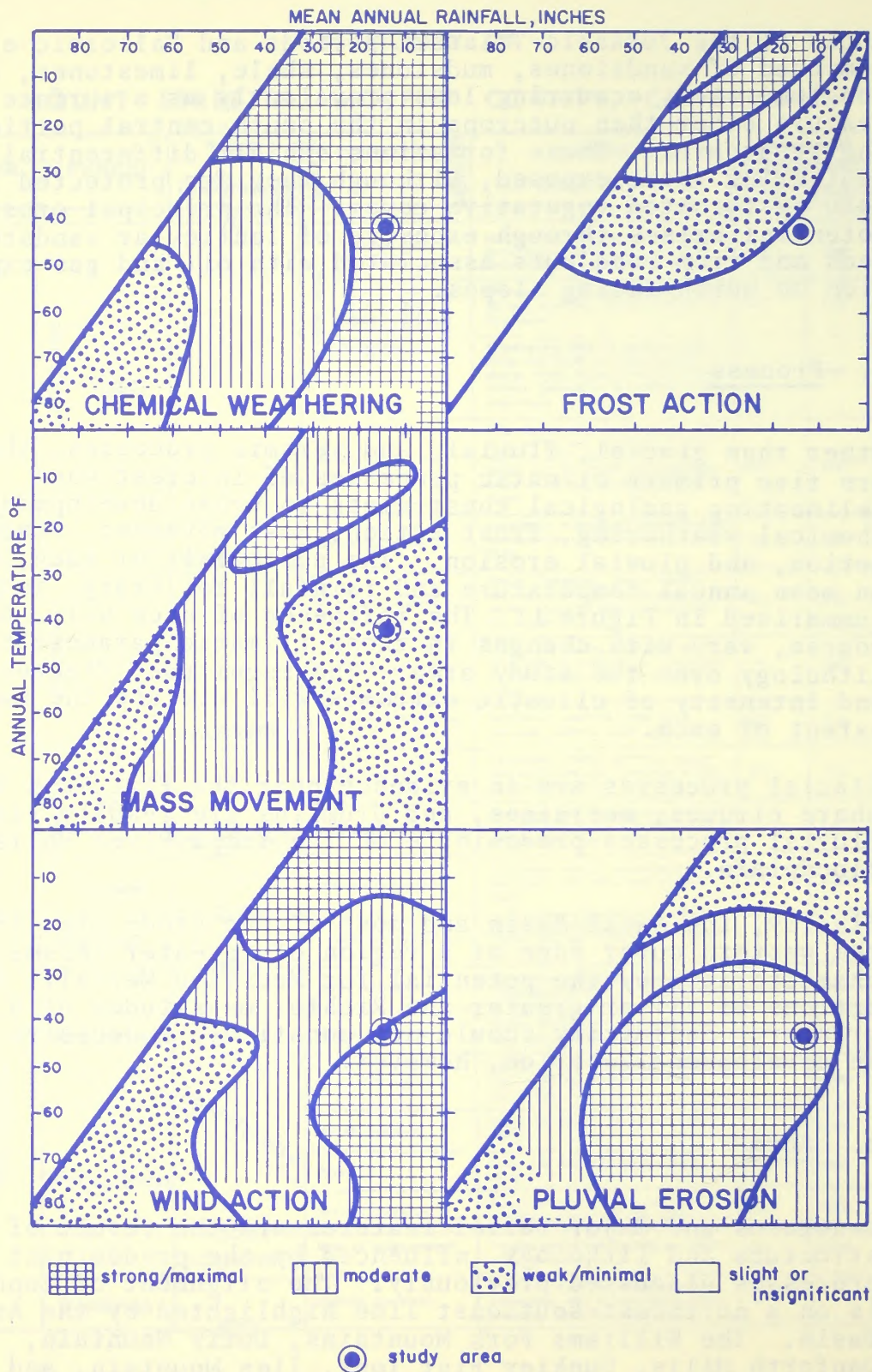
Other than glacial, fluvial, and seismic processes, there are five primary climatic processes of interest when delineating geological constraints to urban development: chemical weathering, frost action, mass movement, wind action, and pluvial erosion. The potential for each, based on mean annual temperature and rainfall for Craig, is summarized in Figure 11. The influence of each will, of course, vary with changes in these climatic parameters and lithology over the study area. The magnitude, frequency, and intensity of climatic extremes will dictate the maximum extent of each.

Glacial processes are in evidence near the Flat Tops area where cirques, morraines, and drumlins are readily visible. Fluvial processes predominate on the Yampa River Valley floodplain.

Finally, the Axial Basin and most of the study area lie at the western outer edge of a region of "greater seismicity" characterized by the potential for Modified Mercalli interactions of VII or greater and Richter magnitudes of 5.0 or greater. Seismicity should not constitute a decisive factor in development location, however.

c. Form

Landforms and major relief features are the result of the structure and lithology influenced by the predominant processes discussed previously. The alignment of topography is on a northwest-southeast line highlighted by the Axial Basin. The Williams Fork Mountains, Duffy Mountain, Danforth Hills, Dunkley Flat Tops, Iles Mountain, and the Citadel Plateau follow this alignment. The Axial Basin anticlinal structure is the foremost factor in producing the



CLIMATIC PARAMETERS FOR CRAIG INDICATED BY —

MORPHOGENETIC REGIONS RELATED BY CLIMATIC PROCESSES

FIGURE 11

SOURCE: ADAPTED BY VTN WITH PERMISSION FROM PETTIER, 1950



cuesta plain landforms. The inclining strata of contrasts resistance have been eroded differentially yielding cuestas with the dip slope coinciding closely to the surface of resistant units of the Iles and Williams Fork Formations.

The cuesta plain has been further modified by volcanic and glacial processes as evidenced by the numerous dikes in the northwest quadrant and cirques in the Flat Tops. It is more likely that development will be considered on more gently sloping, hilly land.

d. Aesthetics

There are several geologic features which serve as interpretive aesthetic resources. In the northeast and southeast corners of the study area, molten material of Tertiary age was forced into the joints and fractures in Cretaceous sediments, solidifying beneath the surface into vertical sheets of rock now exposed as dikes. Just west of Juniper Mountain in the Inception Creek drainage there is an extensive field of relic barcheon and parabolic sand dunes with the remains present as blowouts. They may be as old as five or six thousand years and are left as evidence of climatic change. In the northwest corner of the study area, the Little Snake River watershed is composed of strongly dissected badlands in the Wasatch Formation. The thin sedimentary layers are exposed, yielding a contrasting array of different colored surface units. Glacier cut cirques and Yampa River meanders add further uniqueness to the aesthetic landscape.

The areas of prime aesthetic interest are the Dunkley Flat Tops and the remainder of the Routt National Forest, the Grand Hogback Mountain in the White River National Forest, the Yampa and White Rivers, Duffy Mountain, Iles Mountain, the Williams Fork Mountains and the previously mentioned geologic features. These areas all have the qualities of heterogeneity in composition and constitute the primary aesthetic resources of the study area. It is unlikely that any further portions of the study area will be incorporated at this time into the national forest or national park system. The foremost aesthetic feature continues to be open space.

2. WATER RESOURCES

a. Surface Water

The 3,600-square-mile study area is located entirely within the upper reaches of the Green River Basin of northwest Colorado. The two major stream systems in the area are the Yampa River and the White River drainage. A minor portion of the Little Snake River drainage is also included within the boundaries of the study area. Many smaller streams are tributaries to each of these drainage systems. Numerous small impoundments, mostly man-made stock ponds, and the Upper and Gill Reservoirs lie within the area.

The Yampa River arises on the eastern boundary of the study area, and, flowing westward, is joined by many smaller streams before emptying into the Green River in Colorado. The major tributaries in the vicinity of the project are the Williams Fork River and Trout, Sage, and Evacuation Creeks.

The White River originates to the south of the study area and also flows west into the Green River across the southern half of the study area. Major tributaries to the White River near the project boundaries include Piceance, Yellow and Miller Creeks.

The Little Snake River flows through the region from the northeast and joins the Yampa River roughly 20 miles west of the study area. Table 6 summarizes areas and elevations typical of the three basins.

Table 7 presents a brief outline of the pertinent data regarding volumes of water discharged from these drainages. These streams generally exhibit peak flows in May and June when melting of snow-packs at high elevation occurs. Wide flood plains are created during periods of maximum historic flood. The Yampa River has exhibited a flooded area of over 2,000 feet in many areas. The flood plain of the White River near Meeker is calculated to be about 1,000 feet wide, while the Little Snake River appears to be able to flood over 100 feet of area near its confluence with the Yampa River.

Selected sites within the study area have been sampled for water quality determinations by USGS and Colorado Division of Water Resources personnel. These stations are located on the White River at Meeker, the Yampa River at Milner, the Yampa River near Maybell, and the Little Snake River near Lilly. Table 8 presents selected parameters at these four sites.

TABLE 6
WATERSHED AREAS AND ELEVATIONS

Watershed	Surface Area* (Square Miles)	Elevations**	
		Maximum	Minimum
Yampa River	3,640	12,493	5,920
White River	1,200	12,493	5,786
Little Snake River	144	7,228	5,810

* Value given is for drainage area within or affecting study area.

** Figure refers to topographic features which have effect on the study area.

TABLE 7
**STAGE-DISCHARGE RELATIONSHIPS FOR
SELECTED SITES ALONG THE
YAMPA, WHITE AND LITTLE SNAKE RIVERS**

Watercourse	Period of Record (years)	Average	Discharge (cfs)		Gage Height (ft.) (Maximum)
			Minimum	Maximum	
Yampa River* (4.7 miles east of Hayden)	7	1,077	58	8,080	9.69
Yampa River** (3 miles east of Maybell)	56	1,547	2	17,900	10.40
White River*** (10 miles west of Meeker)	11	616	141	4,010	4.09
Little Snake River**** (10 miles from mouth)	51	569	0	3,280	10.50

* Records good; diversion above station for 30,000 acres.

** Poor records in winter; transbasin diversion and irrigation of about 65,000 acres above station.

*** Records good; diversion above station for 22,000 acres.

**** Records good; diversion above station for about 21,000 acres.

Source: USGS

TABLE 8
WATER QUALITY DETERMINATIONS

Sample Locations	Total Dissolved Solids (Mg/1)	BOD (Mg/1)	HARDNESS (Mg/1)	Coliforms MPN/100 ML	
				Total	Fecal
White River at Meeker (USGS)	349*	1,688*	226*	2,496*	196*
	119-	0.0-	0.0-	5.0-	130-
	619**	3.5**	3.5**	54,200**	240**
Yampa River at Milner (USGS)	153*	1.65*	100*	2,425*	244
	55-	0.5-	24-	15-	2.2-
	398**	4.0**	236**	2,300**	500**
Yampa River near Maybell (USGS)	271*	1.7*	144*	743*	240*
	.001-	4-	43-	2.2-	240**
	436**	11**	384**	4,900**	
Little Snake River near Lilly (USGS)	424*	ND	227*	ND	ND
	95-	ND	58-	ND	ND
	1,180**		732**		

* Average Value

** Range

SOURCE: USGS Water Quality Records

The Colorado State Department of Health has developed a classification system for stream systems based on their primary use. These classifications incorporate a variety of factors which include bacterial, chemical, and physical parameters. The three major streams under discussion are classified as Class B (fish and wildlife habitat) within the vicinity of the study area. Briefly, these designations mean that these waters are "suitable or are to become suitable for all purposes for which raw water is customarily used, except primary contact recreation such as swimming and water skiing" (Colorado Department of Health, 1974). Differences between B₁ and B₂ rated waters involve primarily bacteriological and dissolved oxygen parameters. B₁ streams are designated for cold water fishery and must be maintained at or below 68° F., while B₂ waters must remain below 90° F. for warm water fishery. Therefore, B₂ waters can receive higher concentrations of thermal discharge than can B₁ streams. Differences in bacteriological and dissolved oxygen parameters are also involved in ranking B₁ and B₂ streams.

Based upon this classification system, the Yampa River is a B₁ stream from its source to its confluence with the Williams Fork. Below this point, it has B₂ designations. Both the White and the Snake Rivers are classified as B₁ streams within the study area.

Water quality in western Colorado's stream system is generally highest when sampled near the source, which usually originates in high mountain snow packs. Travel downstream increases dissolution of the underlying mineral beds, resulting in higher concentrations of dissolved and suspended materials. Increased contact with potential sources (i.e., sewage outfalls and non-human fecal material) can greatly modify the bacteriological loadings within the receiving drainage excess of existing standards. Within the study area, water quality is still good but has been degraded somewhat with distance from the respective stream sources (USGS, 1968).

According to 1974 Colorado Land Use Commissions maps, lands within the study area exhibit a highly variable rate of erosion and subsequent sedimentation. The lands around Craig and Meeker exhibit high levels of sediment discharge. The Land Use Commission calculations indicate that 0.5 to 1.0 acre foot (af) of sediment per square mile per year is discharged in the vicinity of these towns. The Yampa River near Craig and several tributaries of the White River near Meeker are classified as having severely eroding stream banks. Sediment yields of from 1.0 to 2.0 acre-feet per mile of stream bed per year have been recorded.

The remainder of the study area is roughly divided into areas which display minimal amounts of erosion-sedimentation (i.e., from less than 0.1 to about 0.2 af/mile²/yr to areas which exhibit levels of 0.2-0.5 af/mile²/yr). Generally, those areas which have the least sedimentation are located in the eastern half of the study area. Ground cover is the greatest in that portion and stream velocities are sufficient to carry much material from the area for ultimate deposit elsewhere.

b. Ground Water

Although Western Colorado possesses the majority of the state's surface water resources, the region has limited subsurface reserves. Geological conditions underlying most of the lands west of the Continental Divide are not favorable for the collection and transport of ground water supplies.

Four general rock types which are capable of storing subsurface waters are found within the confines of the study area. These strata vary in age from Precambrian to Holocene and are grouped into four basic geohydrologic units according to age and overall lithologic characteristics. The approximate distribution of each of these units within the Study Area is shown on the base map available separately from this report. As described in USGS Atlas HA-447, these geohydrologic units are unconsolidated deposits, igneous rocks, continental deposits, and marine deposits.

Wide variances in hydrologic characteristics exist within each unit as well as between respective units. Only very general information is currently available to describe the regionwide ground water condition.

Geohydrologic Unit (GU) 1 (unconsolidated deposits) is composed of unconsolidated sands, clays and gravel deposits of Quaternary age and is divided into alluvial and colluvial aquifer systems. When saturated, alluvial deposits can produce wells of over 1,000 gallons per minute (gpm) while colluvial systems generally can yield less than 20 gpm.

GU 1 has the highest hydraulic conductivity of any of the four rock types found within the study area but is limited to only about 4 percent, or 160.4 square miles of the total area considered.

Water quality in GU 1 is generally characterized as having high concentrations of calcium, magnesium, bicarbonate and

sulfate. Total dissolved solids of more than 1,000 milligrams per liter (mg/l) are often found. Leaching and concentration through evapotranspiration account for these increased levels.

GU 2 (igneous rocks) was formed by lava flows and pyroclastic deposits of late Tertiary to early Quaternary age. Widely varying yields of from 10 gpm to almost 1000 gpm are found within the unit. Depths to water of from 50 to 500 feet have been recorded (USGS, 1973).

This unit is even more limited in size within the study area than GU 1. Approximately 90 square miles, or about 2.5 percent of the total area, is composed of this material.

Water qualities within GU 2 vary from about 500 mg/l of TDS to over 3000 mg/l depending upon rock type and depth to water. The unit is characterized by high hydraulic conductivities.

GU 3 (continental deposits) contains Jurassic and Tertiary deposits of eolian and fresh-water origin. GU 3 is generally composed of siltstone and sandstone but also includes conglomerate, shale and limestone. Geologic units of importance are the Green River Formation southwest of Meeker and the Entrada Sandstone which outcrops east and southeast of Meeker. Water yields are generally small, although areas of non-water bearing strata exist. Very localized conditions of high yield wells (up to 1000 gpm) could be expected in the Green River Formation as wells of this capacity have been drilled nearby (USGS, 1972). Depths to water vary widely within this unit. USGS figures suggest that water can be found at depths from less than 50 feet in valleys to over 500 feet on plateaus.

Lower hydraulic conductivities are found in this unit than in the two preceding ones, but large volumes of water can be expected since over 31 percent of the study area overlies this strata type. Consolidated rocks constitute the majority of this geohydrological unit. Water yield is a function of fracture porosity with faults, fractures, joints and solution cavities providing the major water-bearing capability.

Water quality from the Green River Formation is dependent upon the depth of the well. Total dissolved solids concentration of less than 1000 mg/l are found at depths of less than 1000 feet, while moderately to highly saline water is found below 2,000 feet. Sodium, chloride and bicarbonate are the predominant ions present.

GU 4 (marine deposits) is the most extensive strata type, occurring over 57 percent of the total study area. It is composed of Cambrian to Permian, Triassic and Cretaceous materials consisting of shale, siltstone, sandstone and carbonate materials. Important geologic units within the geohydrologic unit are the Mesa Verde Group, which is the thickest aquifer within the study area, and the Glen Canyon and Wingate Sandstones. Generally poor water yields are exhibited from wells in GU 4 except where extensive sandstone is found. From 1.0 to over 40 gpm can be expected from properly constructed wells where water is encountered (USGS, 1972). Depths to water are highly variable, as with GU 3, and specific information is lacking. This unit displays the lowest hydraulic conductivities among the four ground water units within the study area. Water quality is also poorest because the aquifer material was deposited in a salt water environment. Leaching of rock strata had resulted in some saturated zones containing more than 3,000 mg/l of dissolved solids (USGS, 1973). Total storage ranges from a minimum of 3,216 acre-feet to a maximum of 11,761 acre-feet.

These data were derived from figures given by the USGS for average specific yield and saturated thickness values for the region. The area contained in each geohydrologic unit was calculated from structural maps accompanying the Geological Survey's analysis. As used in these reports, ground water storage is the volume of water that will drain by gravity from the strata where it is found. This value is the product of estimated specific yields and expected volumes of saturated area within the main zones of saturation.

Over 90 percent of the maximum estimated volume of stored water is found in Geohydrologic Units 3 and 4. These units will yield water slowly, even to properly designed and developed well systems whenever water is encountered. Because large portions of these units are characterized as having fracture porosity rather than possessing true aquifer systems, exploration drilling for a dependable water supply will involve a high degree of risk, and additional expense will be required for pre-drilling investigation and analysis.

Only about 9 percent of the estimated water volumes contained beneath the study area are found in GU 1 and GU 2, where hydraulic conductivities are highest. Much of this water is already appropriated and must be purchased if a water right is to be acquired.

c. Water Rights

Water rights in Colorado are acquired through the auspices of the various district offices of the State Engineer's Office and through the Water Court. Permits for water rights are granted by the district office and adjudicated in the Water Court.

At the present time, water is available for appropriation within the Study Area. Water rights exist for the White River and Yampa River drainages. No additional surface or alluvial aquifer rights can be added to the following streams:

- Milk Creek
- South Fork of Williams Fork
- Coal Creek
- Marapos Creek
- Waddle Creek
- Flag Creek

Those stream systems where every water-right application must be evaluated in relation to added pressures upon the system are

- Dry Creek
- Grassy Creek
- Holderness Gulch
- Morgan Creek
- Peck Gulch
- Sage Creek
- Trout Creek
- Wolf Creek
- Deception Creek
- Elk Head Creek
- Price Creek
- Fortification Creek
- Long Gulch
- Willow Creek
- Big Beaver Creek
- Little Beaver Creek
- Miller Creek
- Deep Channel Creek

Water rights would have to be purchased or water imported for all types of riparian developments along these stream systems with the exception of residential units.

Impacts of proposed development within the study area can be discussed only in general terms until the exact character and location of development is known. The physical presence of a development will cause loss of ground water recharge areas through construction and paving of lands with relocation of ground water reserves resulting. Consumptive use of surface water will lead to decreased stream flows and loss of biological habitat in surface streams serving as a source of drinking water supply. Some streams may possibly have to be relocated to minimize flood hazards, depending upon development location.

There could be additional impacts on water quality resulting from contact with improperly treated wastewaters and

alteration of biological habitat due to wastewater discharge. Erosion and sedimentation could also be produced from industrial chemicals which might reach the drainage.

It should be noted that the occurrence and severity of these impacts will depend greatly on the specifics of community development size and location. In addition, many of these potentially adverse effects may be eliminated or greatly reduced by inclusion of mitigation measures in the planning of the project. Steps which could serve to minimize potentially adverse impacts would include implementation of comprehensive monitoring to establish baseline values within the respective drainages and installation of adequate sewage treatment facilities to eliminate excess nutrients, BOD, and bacterial populations. These parameters should be reduced to a point below the indigenous value of the receiving stream. External processes which may be developed could include incorporation of sufficient political and legal control to insure that water-quality guidelines are met and implementation of adequate legislation to curtail flood plain development.

3. CLIMATE AND AIR QUALITY

a. Climate

The macro-climate of northwestern Colorado can be described as typical of a high plains, continental, mid-latitude region with warm summers and cold winters characterized by high diurnal and seasonal temperature variations. The low relative humidity usually makes the hot summer days pleasant. The summer nights are generally cool because of strong outgoing terrestrial radiation. The combination of dry air and strong solar radiation tempers the cold temperatures of winter days and allows human activity with reasonable comfort.

The fundamental climatic controls of importance in the region are elevation, the shape of the land mass, and the location in relation to the long wave patterns. The outstanding characteristic of this climate is its aridity and is sometimes referred to as semi-arid steppe. The flow of Pacific air dominating the climate descends into the area as a warming and drying mass after depositing its moisture over the western slopes of the Sierra Nevada and Cascade Mountains. A large rain shadow is created over Nevada, Utah, and western Colorado by the blocking action of these natural barriers to the moist, maritime air.

Intense cold waves are rare because of the barriers created by the mountains of the Continental Divide. Generally, severe storms and low pressure systems bypass the region by deflection north or south over lower elevations of the Rocky Mountains in Wyoming and New Mexico, respectively. The predominant air mass over the Rocky Mountains during the winter is usually continental polar and sometimes maritime polar and produces cold dry air during storm-free periods. High pressure systems that result in fine, light, powdery snow tend to become established in winter over the region which lies within the mean winter storm track.

During the summer months, the air masses are generally maritime polar and, much less often, continental tropical. This region is usually south of the main storm track in the summer; however, fast-moving, localized thundershowers do occur primarily during the afternoons if a moisture supply is available either locally or in the air mass. These showers are often torrential bursts, and once the natural vegetation cover is broken, erosion accelerates rapidly.

Elevation, topography, vegetation, soil type and moisture, and air drainage are all important factors influencing the local or mesoclimate and the micro-climate of the area. The climate in site-specific areas can vary considerably from the regional climate, particularly in surface wind patterns.

Long-term weather records are virtually nonexistent for most climatic elements in the region. There are some available data, primarily for temperature and precipitation from meteorological stations within the region in the following locations: Steamboat Springs, Hayden, Craig, Meeker, Rangely, and Rifle. Precipitation data have also been collected at Columbine, Pagoda, and Yampa. In addition, special meteorological studies have been conducted in the vicinity of Hayden and Craig in conjunction with the Yampa Project. The summary of regional climatological data is given in Table 9.

Precipitation in the study area varies by location in relation to the Continental Divide. Table 9 also shows the regional average amounts of snowfall and precipitation.

The synoptic flow in the study area is characterized by prevailing westerly winds, which influence air quality in the region. The direction and speed of the winds are greatly affected by the local topography. The study area contains two large drainage basins: the Yampa River Basin and the Williams Fork River drainage system. The Yampa Valley forms a broad box canyon which channels the airflow into an east-west orientation reflecting upslope and downslope motion.

TABLE 9
SUMMARY OF REGIONAL CLIMATOLOGICAL DATA

Station	Mean Annual Temperature (°F.)	Temperature		Precipitation	
		Maximum Recorded Temperature (°F.)	Minimum Recorded Temperature (°F.)	Average Annual Snowfall	Average Annual Precipitation
Steamboat Springs	39.0	99	-54	166.9"	23.50"
Hayden	41.4	102	-44	97.6"	15.50"
Craig	42.0	100	-45	62.0"	13.40"
Meeker	44.4	100	-33	91.5"	17.68"
Rangely	42.8	104	-37	40.8"	8.87"
Rifle	47.8	104	-34	37.8"	10.93"
Columbine	---	---	---	181.2"	22.90"
Pagoda	---	---	---	106.2"	18.50"
Yampa	---	---	---	76.6"	16.00"

(--) Data Unavailable

SOURCE: U.S. Weather Bureau

Similar upslope-downslope wind flow exists in the Williams Fork Valley. The flow draining this valley is directed northwardly along the high ground west of Craig prior to joining the main stream flowing up and down the Yampa Valley at the end of the ridge.

A high frequency of near-calm conditions exists because of the protection afforded by the local terrain in most of the valleys. These conditions generally occur at night and in the early morning. The strongest winds can be expected during the winter and early spring, especially in March, and briefly during summer thunderstorms.

Steepness and direction of canyons and their relation to prevailing winds will be a major factor in determining up-canyon wind speed. The top ridge of steep canyons may experience strong winds greatly in excess of the speed of the prevailing winds. Wind direction may eddy in several directions around peaks, saddles, and ridge tops. Unequal heating of the land surface because of terrain and rapid heat disbursement into the atmosphere due to the high altitude will result in the formation of many local wind patterns.

Meteorological studies conducted near Craig in conjunction with the Yampa Project determined four categories of stability: stable, transition, neutral, and unstable conditions. Drainage of cold air from the surrounding higher ground results in the buildup of a stable air layer. This inversion condition usually forms at night and was found to exist at ground level approximately 60 percent of the time. The mean depth of the stable layer was found to be about 1300 feet near Hayden and 1100 feet near Craig. With increased surface warming, thermal mixing takes place during such a transitional phase. This was measured 18 percent of the time. When synoptic air flows become dominant, neutral stability exists, usually with higher windspeeds. This condition was recorded 29.5 percent of the time during the Yampa Project study. Unstable conditions occurred infrequently, primarily during the summer. It is assumed that similar stability conditions would exist in some of the other drainage basins within the area; however, meteorological studies would be required to accurately define the inversion and stability characteristics for each airshed and drainage basin.

b. Air Quality

The regional area under study is located in the Yampa Air Quality Control Region (AQCR), as designated by the State of Colorado. The existing ambient air quality in the region is good. Ambient pollutant concentration data are limited to particulates monitored by high volume air samplers. Gaseous pollutant monitoring information for the region is nonexistent except for short-term monitoring conducted near Craig in conjunction with the Yampa Project. This monitoring commenced in March, 1971, and was conducted during the following two years.

The 1973 ambient monitoring data for suspended particulate matter for stations within the region are summarized in Table 10. Particulate loadings throughout the majority of the Yampa AQCR are typical of non-urban areas subject to occasional dust storms. With the exception of the station at Steamboat Springs, all values are below the federal primary standard of 75 micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$) annual geometric mean. The higher values for Steamboat Springs are attributed to heavy ski traffic and extensive street sanding during the winter and to an intensive construction program during the summer months. Concentrations monitored in the towns of Steamboat Springs, Craig, Meeker, and Kremmling by the Colorado Department of Health exceeded the Colorado air quality standards for non-designated area set at $\mu\text{g}/\text{m}^3$ annual arithmetic mean. The higher values are primarily due to increased levels of transportation and other activities in the more populated areas.

The Colorado ambient air quality standards are presented in Table 11. Dustfall rates measured in the Craig vicinity varied from 2.2 to 4.3 tons per square mile per month (T/sq. mi/mon.) which is typical for a rural area. The average was about 2.8 T/sq. mi/mon.

Monitoring conducted in the Craig area in conjunction with the Yampa Project indicated very low background levels for sulfur dioxide and nitrogen oxides. The 24-hour average value determined for sulfur dioxide was 0.0019 parts per million and 0.04 parts per million for nitrogen oxides. Both values are less than state and federal standards. At present, there are no state standards for nitrogen oxides.

The major emission source in the Yampa AQCR is the Hayden power plant complex. One 250-MW, coal-fired generating unit is operating and another is under construction and scheduled for completion in 1975. Another two 380-MW generating units

are planned for completion in 1978 and 1979 southwest of Craig. Minor sources in the region include a number of asphalt batch plants, wigwam wood waste burners, aggregate crushing plants, and surface coal mining and processing operations. Transportation sources also contribute to the regional emissions. The emission inventory for the study area is summarized in Table 12.

TABLE 10
AIR QUALITY PARTICULATE CONCENTRATIONS
FOR THE YEAR 1973

Location	PARTICULATES CONCENTRATIONS MICROGRAMS PER CUBIC METER OF AIR (mg/m ³)			
	Geometric Mean	Arithmetic Mean	High Value	Low Value
Steamboat Springs	108	130	469	28
Hayden	27	32	82	1
Craig	67	77	220	5
Meeker	56	69	227	3
Rio Blanco	14	20	144	3
Rangely	31	33	168	6
Kremmling	70	82	208	13

SOURCE: Prepared by VTN (from Colorado Air Pollution Control Division Data)

TABLE 11
AMBIENT AIR STANDARDS FOR
METROPOLITAN DENVER AIR QUALITY CONTROL REGION
AIR QUALITY CONTROL AREAS, AND
THE STATE OF COLORADO

SUSPENDED PARTICULATE MATTER AND SULFUR DIOXIDE
(Micrograms per cubic meter—ug/m³)

Pollutant	Non Designated Areas	Metro-Denver Air Quality Control Region, and Designated State Areas		
		1973	1976	1980
Suspended Particulate Matter ¹	150	200	180	150
Short Term ³⁽ⁱ⁾				
Long Term ⁴	45	70	55	45
Sulfur Dioxide ²				
One Hour Level ⁵		800 (0.28) ⁶	300 (0.10) ⁶	
Short Term ³⁽ⁱⁱ⁾	15 (0.0050) ⁶	300 (0.10) ⁶	150 (0.050) ⁶	55 (0.020) ⁶
Long Term ⁴		60 (0.020) ⁶	25 (0.0090) ⁶	10 (0.0040) ⁶

¹ Measured at ambient conditions.

² 0° Centigrade—760 mm Hg (Torr.)

³ Short Term Level

(i) A 24-hour maximum of any 24-hour period and must not be exceeded more than once in a 12-month period.

(ii) A 24-hour maximum arithmetic mean of any 24-hour period, and must not be exceeded more than once in a 12-month period.

⁴ Long Term Level—An annual arithmetic mean of all 24-hour concentrations.

⁵ One Hour Level—A 1-hour maximum arithmetic mean in any 24-hour period, and must not be exceeded more than once in any 1-month period.

⁶ () = Equivalent values in parts per million (1 ppm = 2860 ug/m³ at 0° and 760 mm Hg (Torr)).

SOURCE: Colorado Air Quality Control Regulations and Ambient Air Quality Standards 1970.

TABLE 12
EMISSION INVENTORY SUMMARY (ton/year)
1970 DATA

Source Category	Moffat					Rio Blanco					Routt				
	Particulates	SO _x	CO	HC	NO _x	Particulates	SO _x	CO	HC	NO _x	Particulates	SO _x	CO	HC	NO _x
Fuel Combustion	1	---	---	---	---	---	---	---	---	---	2,438	7,195	270	81	4,869
Process Losses	23	---	---	9	---	8	---	---	7	---	---	---	---	9	---
Solid Waste Disposal	36	---	178	36	---	27	---	136	48	---	82	---	187	66	---
Transportation	---	6	4,173	690	241	---	25	3,289	524	128	---	8	4,197	690	266
Total	60	6	4,351	735	241	35	25	3,425	579	128	2,519	7,203	4,654	846	5,135

Source: Prepared by VTN (From Colorado Air Pollution Control Division Data)

The increase in construction activities caused by development will change existing air quality and will result in increased fugitive dust emissions, as well as other particulate and gaseous emissions. These added emissions, in all probability, will have only a very minor impact on the overall air quality of the region. This is especially true when comparing the entire natural resource development slated for the region with that caused by the development of the Colowyo Mine. The new coal-fired generating units under construction and the proposed new surface coal mines and oil shale processing plants will emit considerably more pollutants. The cumulative effect of all the developments and related population increases will produce definite impacts on the air resources. It is expected that visibility will be reduced and that the existing air quality will be degraded in the region. These conditions will occur primarily during the winter months when there are frequent temperature inversions trapping the pollutants within the mountain valleys.

4. BIOLOGY

a. Vegetation

Six vegetative communities exist within the region: sagebrush, oak shrub, juniper woodland, aspen, mixed conifer, and improved range. For a species list of characteristic plants and animals found in the region, refer to Appendix B.

This study area is characterized by the almost complete dominance of Artemesia tridentata (big sagebrush). The physiognomy (growth form) of this community is scattered shrubs of medium height rarely exceeding four feet.

There are varying amounts of space between shrubs and a sparse understory of various bunchgrasses and forbs. This community will usually develop in areas where soil moisture is a limiting factor. Where soil and water conditions are favorable, snowberry, serviceberry, cattails, cottonwoods, scattered junipers, Gambel's oak, and numerous other plant species will occur within the sagebrush community.

Oak shrub associations often occur within the study area; however, they are more restricted than the sagebrush. This plant community is widespread in Colorado between elevations of 5,000 and 7,000 feet (James and Marr, 1966). The shrubs of this community range from 3 to 12 feet tall. Typically, the oaks grow in large clumps with zones of sagebrush or

grasses existing between the denser oak and serviceberry stands. Within this association, snowberry is more commonly found in sage communities. Numerous forbs and grasses occur in varying densities throughout this community.

Juniper woodlands are dominated by Juniperus osteosperma (western juniper). On these sites, the pinyon is widely scattered or absent entirely from the community, leaving the woodlands dominated by juniper. Due to its physiognomy, this vegetation unit is often referred to as pygmy forest (Woodbury, 1947). The trees rarely exceed 15 feet in height and the canopy of the forest is rarely closed. Sagebrush is also a conspicuous member of this plant association on all the sites, with various forbs and grasses occupying much of the spaces between the trees.

Aspen communities are found infrequently on high, moist, or north-facing slopes throughout the region. Aspen is found in pure stands north of Craig and east of Fortification Creek. These aspen stands have an understory of chokecherry, serviceberry, snowberry, lupine, yarrow, brome grass and a great variety of other herbs and grasses. Aspen stands may contain lodgepole pine or Douglas fir in varying densities depending on the topographic and historical features.

The mixed conifer ecosystem is a grouping of spruce, subalpine fir, lodgepole pine, and Douglas fir with aspen intermixed to a lesser extent. The mixed and often pure stands of one species are found at higher elevations of the region along the Rio Blanco County line and in the Pinnacle Mountain area. The shrub and herb understory is generally sparse in this community where the canopy is closed. Raspberry rose, buffaloberry, peavine, vaccinium, and arnica occur here along with other herbs and grasses.

The improved range classification is intended to include those areas that man has developed for agricultural uses: irrigated and non-irrigated croplands, pastures and rangeland.

b. Ecosystem Interrelationships

The vegetation on these properties is a complex mosaic where moisture, exposure, grazing, and general land use history are the controlling factors in the plant distribution. On the western slope of the Rocky Mountains, moisture is the general limiting factor for the distribution of vegetation and wildlife (James and Marr, 1966). On these properties, stands of oak and serviceberry develop on the slopes where

snow collects and lies late or where moisture is in adequate supply throughout the spring. On dryer sites where moisture is more limiting, the stands become dominated by serviceberry. The sagebrush communities dominate all those locations where moisture is limiting to the other vegetation components. These include many south- and west-facing slopes and ridge tops. Occasionally, individual serviceberry bushes will occur among the sagebrush where localized topographic influences produce a favorable microsite for growth and development. Brown (1958) points out that the absence of coniferous species on north-facing slopes is strong evidence for the stability of the shrub/oak communities. Brown (1958) also suggests that the extent and density of the shrub/oak vegetation type in West Central Colorado is probably not much different today than it was in the late 1800s.

The riparian community occurs where moisture is persistent during the spring or throughout the growing season. Since these conditions are limited, the riparian association is also of limited extent.

Juniper woodland within portions of the study area is restricted to the ridgetops and bedrock walls. In these locations, soil is very shallow or nonexistent. Physiologically, these coniferous species are unable to tolerate the accumulation of fine soil particles around the roots, so they occur only where the bedrock is close to the surface or outcrops. Woodbury (1947) demonstrated that sagebrush is adapted to fine, deep soils and juniper to coarse porous soils, and that these vegetation types are segregated on that basis. In the present locations, the juniper woodland consists almost exclusively of juniper. The absence of pinyon may be because the site is near the northern distribution limit of this species or because of historical disturbances such as fire or disease. Juniper is often found to recover from disturbance more readily than pinyon (Woodbury; 1947).

Grazing appears to have had or it continues to have a profound influence on these ecosystems. Much of the region shows signs of overgrazing such as soil trampling, decline of grasses, weedy species, and vast quantities of scat. The primary plant communities present are stable or "climax" for the topography and elevation of this region of Colorado (James and Marr, 1966). If a major disturbance, such as a fire, should destroy either the sagebrush or the oak-serviceberry communities, it is doubtful whether the seral stands would differ in species composition from the climax ones. Rather, it is more likely that the changes would be more in terms of species densities. Weedy annuals would also occur in larger numbers than are now present. The return to

climax conditions would depend on the extent to which the landscape was protected from further disturbance and the natural controlling factor of moisture. It can be expected that sagebrush communities would expand in areas if destruction of the other communities should occur.

c. Wildlife

The Axial Basin and the Yampa Valley provide critical winter range for elk and year-round range for mule deer, according to the Colorado Division of Wildlife.

This area is heavily used for hunting. The Williams Fork and Yampa Rivers area within the study boundaries is one of the most productive areas in Colorado for small game such as sage and sharp-tailed grouse (Colorado Fish and Game Division, 1973).

Major migration routes of elk and deer occur through the central portion of the study area. The streams and riparian vegetation in this area also attract migratory waterfowl. These migration routes are mapped and are available separately from this report.

The dominant mammals in the region are rodents. They range from the relatively large yellow-bellied marmot which lives in rocky areas to the small deer mouse which is found throughout the area and is probably the most abundant mammal. Along with the rodents, the blacktail jackrabbit and desert cottontail are important primary consumers, eating either seeds or green vegetation. The principal mammalian predators in the area are the coyote, bobcat and long-tailed weasel.

The sage and oak communities support a great variety of seed-eating birds such as the rufous-sided and green-tailed towhees, chipping sparrow and Oregon junco. Most of these birds are summer residents only and are listed in Appendix B. Predatory birds are numerous in the area and are mostly the marsh hawk and red-tailed hawk.

Due to their nocturnal habits, few reptiles or amphibians were observed on the subject property; however, the area contains the habitat of the species listed in Appendix B. The most abundant lizards are probably the eastern fence lizard, sagebrush lizard and side-blotched lizard. The gopher snake and western rattlesnake are probably the most common snakes in the area.

The only animal known to occur in the vicinity of the site that is listed as officially endangered is the American peregrine falcon (Falco peregrinus anatum) (Bureau of Sport Fisheries and Wildlife, 1973). This species breeds in areas with steep cliffs and has been sighted in the Williams Fork Mountains.

It should be noted that the greatest general effect on the ecosystems by development will result primarily from the reduction of wildlife habitats and forage. Because the study area is used as major migration routes and winter forage for game animals, both community and industrial development should be planned to minimize impacts to migration routes and prime forage areas.

C. ARCHAEOLOGICAL, PALEONTOLOGICAL, AND HISTORICAL RESOURCES

While antiquities are known to exist in the study area, there is insufficient knowledge as to their full extent and nature. Few inventories have been conducted for historical, archaeological, and paleontological resources, and searches of site records and reviews of available literature indicate that little scientific research has occurred in the area. Most of the information on the nature of these resources is provided by literature reviews of adjacent areas.

Various federal and state laws require preservation and protection of antiquities. These are as follows:

- The Antiquities Act of 1906 (Public Law 59-209, 34 Stat. 225)
- The Historic Sites Act of 1935 (Public Law 74-292; 49 Stat. 666)
- The National Historic Preservation Act of 1966 (Public Law 89-665; 80 Stat. 915)
- The National Environmental Policy Act of 1969 (Public Law 89-665; 83 Stat. 852)
- Executive Order 11593, "Protection and Enhancement of the Cultural Environment," May 31, 1971 (36 F. R. 8921, May 15, 1971)
- The Archaeological and Historical Data Conservation Act of 1974 (Public Law 93-291; 74 Stat. 220 as amended)

- The Colorado Antiquities Act of 1974 (Colorado Revised Statutes 1963 (1967 Supp.) Article 12 of Chapter 131)
- Guidelines for Identification and Designation of Historical, Natural, and Archaeological Resources State Historical Society of Colorado; prepared in compliance with House Bill 1041, adopted by the 1974 General Assembly as a new article to Chapter 106 of the Colorado Revised Statutes, 1963, as amended

The requirements of these laws are explicit. It is the expressed policy of federal and state agencies to preserve, protect, and recover antiquities. An inventory and evaluation must be conducted to assess impacts to historical, archaeological and paleontological resources on any private or public projects under federal or state jurisdiction. The inventory and evaluation must be conducted through authorized agencies and personnel for proper protection of recovered data. If destruction of a site is imminent, then recovery of the data is required.

Appendix C contains a list of institutions which supply information on qualified professionals, site locations, and applicable procedures for antiquities preservation.

1. ARCHAEOLOGY

The known archaeological resources in the study area are limited. No academic research has been conducted, making statements of significance tentative. The few known sites were located during inventories and evaluations by avocational archaeologists made for the Yampa Valley Project and for the BLM Unit Resource Analysis.

Twenty-six archaeological sites are recorded in the study area. In compliance with the laws affecting antiquities in these areas, archaeological site records are now being compiled. The absence of sites in a given area should not be taken to mean that none exists; only that little or no recorded inventories for archaeological resources have been conducted.

The recorded sites are mainly associated with hunting and gathering groups. A number of them are probably associated with recent Ute Indian cultures as evidenced by pictographs and petroglyphs depicting shield and buffalo symbols. Most habitation sites are open campsites or rock shelters exhibiting little cultural deposition and are typical of sites utilized on a seasonal basis. The remainder are

chipping stations (locations of lithic toolmaking) containing few diagnostic artifacts.

2. PALEONTOLOGY

Little is known of the paleontological resources in the study area. Peter Robinson of the University of Colorado Museum has provided a statement on potential locations of paleontological resources. These locations are derived from research in fossil-bearing geologic strata in adjacent areas which also occur in the study area. No statements on the significance of these resources can be made, although research in adjacent areas has produced significant results and fossil locations. Dinosaur National Monument is one of these and is located 80 miles to the west.

One paleontological site was located during field investigation by VTN. It consists of oyster-like shells (species unknown) and it is in the same location as archaeological site 5-MF-291.

3. HISTORY

Historical resources in the study area are few in number when compared to the rest of the state. A variety of environmental and social conditions excluded the area from extensive economic development until recent times. Physiographic features tended to isolate the area until the arrival of the railroad and modern highways. The long winters and short growing season have limited agriculture to the livestock industry.

The locations of national and state historical places in the study area were obtained from the Colorado State Historical Society. Information pertaining to additional historical site locations was received from the BLM district office in Craig. These are available separately from this report.

It must be stated that at this time state and national registers are incomplete. Prior to the Historic Preservation Act of 1966, only historic sites of national significance were registered. The Act now includes sites of state and local significance as eligible for nomination to the National Register of Historical Places. Government agencies and avocational organizations concerned with historical resources are now conducting inventories of eligible sites. A case in point is the Thornburgh Battle Site near Meeker, the location

of a battle between the U.S. Cavalry (under the leadership of a Major Thornburgh) and a band of Ute Indians; a marker was placed there shortly afterwards. Previous attempts to place it on the National Register have been unsuccessful; but since the passage of the Act, the site has been renominated for registration by the BLM.

Known archaeologic, paleontologic, and historic sites have been entered into the composite mapping process on a site-specific basis. Because of the importance of archaeological, historical, and paleontological sites in understanding past civilizations, locations are kept confidential to avoid vandalism. Regardless of the type of development, federal and state antiquities laws and regulations must be complied with prior to issuance of permits if on state or federally-controlled lands. Antiquities impacts will therefore be limited to site-specific considerations should field investigation locate or identify a new or present site.

D. LAND USE CHARACTERISTICS

The primary contributions to the regional economic base, in terms of land usage, have been agriculture and mining. Because of the aridity of the region, agricultural use has been limited generally to grazing (sheep and cattle) and some dryland farming to supply feed, primarily in those areas where water is presently available. As the mineral activity increases in the region and water protection rights are obtained, agriculture will decrease.

Recreational land usage is currently limited to hunting and fishing. As the region becomes more industrialized, however, the recreational activities associated with urbanization will increase and the natural types of recreation will decrease.

Tables 13 and 14 give the regional land ownership and characteristics by county for the Tri-County Region.

1. MINERAL RESOURCES AND DEVELOPMENT

The most significant mineral resource within the study area is coal, with Colorado's largest surface coal reserves found in Routt and Moffat Counties. In the past, electric utilities serving population centers in eastern Colorado have utilized most of Colorado's coal production. In the future, there will be greater demands on Colorado's coal

*Low sulfur content
HAYDEN-?*

TABLE 13
LAND OWNERSHIP
TRI-COUNTY REGION
(IN ACRES)

Ownership	Moffat County	Routt County	Rio Blanco County
Private	1,498,126	949,424	590,955
Federal	1,600,967	671,428	1,583,817
State	203,177	67,761	None
County and Municipal	7,521	2,841	NA

NA - Not Available

SOURCE: Soils Conservation Service (unpublished material)

TABLE 14
LAND USE
TRI-COUNTY REGION
(IN ACRES)

Classification	Moffat County	Routt County	Rio Blanco County
Rangeland	1,142,678	449,234	408,500
Irrigated Cropland	(included in Irrigated Pasture)	1,000	32,500
Non-Irrigated Cropland	68,670	74,854	20,500
Irrigated Pasture	30,000	60,600	16,000
Non-Irrigated Pasture	28,087	4,900	7,000
Privately Owned Woodland	14,000	152,430	22,800
Commercial and Industrial	10,857	8,000	**
Residential and Subdivision	NA	15,100	4,418

** No Land Specifically Labeled As Such

NA - Not Available

SOURCE: Soils Conservation Service (unpublished material)

reserves, particularly on those within the study area.

a. Surface Mining

Surface coal mine production for Colorado, which was insignificant until after World War II, provided 1.8 million tons in 1968. Most of this production came from three surface mine operations in Routt County, making it first among Colorado's 14 coal-producing counties.

Considerable mining activity has occurred in the Williams Fork Planning Unit, managed by the BLM. Surface mines within the planning unit produced 2.5 million and 2.8 million tons of low sulphur coal in 1972 and 1973, respectively (BLM, 1976). The total amount of land disturbed by surface mining operations within the planning unit exceeds 4,000 acres. Coal lease acreage for the planning unit is currently about 28,620. Existing coal prospect permits cover about 6,720 acres. Applications for coal leases and coal prospecting permits have been made for approximately 27,700 and 20,760 acres respectively (see Appendix D).

b. Mining and Power-Generating Plant Operations

There are presently six active mining operations; their capacities are itemized in Table 15 (see also Presentation Map 8 separate from this report). As noted in Table 15, the production of Seneca Strip Mine No. 2 is delivered to the Hayden electric generating plant, operated by Colorado Ute Electric Association. The present capacity of the plant is 170 megawatts (MW). This capacity is to be doubled, then tripled, to provide a capacity of 500 MW. By the end of the decade, this latter capacity will be boosted to 1,000 MW. Additionally, there will be a second 1,000 MW plant at Craig (Yampa Project) and a third 1,000 MW plant near Milner. Utah International has leased an area south of Craig (from federal and state lands and private holdings) for an approved coal mine to serve the Yampa Project. Understandably, much of the existing coal resources will be utilized within the study area.

c. Coal-Related Development

An increasing amount of coal exploration activities are occurring within the study area. Specific drill logs, data, and results are in the custody of the USGS. Much of the information is confidential.

TABLE 15
STUDY AREA PRODUCTION FOR EXISTING MINES
(Indicated Tonnages for 1974)

Mine and Ownership	Work Force (Employees)	Daily Capacity (Tons)	Annual Production
Wise Hill No. 5 Silengo Coal Company Indianapolis, Indiana	51	42,588	212,010
Apex No. 2 Routt Mining Co. Oak Creek, Colorado	8	1,289	11,282
Edna Strip Mine Pittsburg 4 Midway Coal Co. (Gulf Oil Corp.)	65	95,510	1,134,089
Energy Strip Mine No. 1 Energy Fuels Corp. Indianapolis, Indiana	112	94,652	1,240,150
Energy Strip Mine No. 2 Energy Fuels Corp. Indianapolis, Indiana	24	104,100	575,393*

* Production goes to Colorado Ute Electric Association to fuel the Hayden Plant.

SOURCE: Colorado State Department of Mines

Table 23 outlines anticipated development that will impact the study region within the next five years. In addition Appendix D gives the recorded mineral lease holdings that will be developed should legislation and energy demand warrant.

2. AGRICULTURE

As has been stated, the predominant land use within the study area and the region is currently agriculture. This includes lands utilized as rangeland and non-irrigated pasture lands. Rangeland includes land that provides grazing for both livestock and big game animals. The Tri-County Region contains over 2,000,000 acres, or 86.4 percent of the total land area, of rangeland. Less than 200,000 acres are classified as actual cropland.

Vg. 6496

3. COMMERCIAL AND INDUSTRIAL USES

Only a very small portion of the region and the study area can be classified as commercial or industrial. These areas are located within the corporate limits of the three municipalities of Craig, Meeker, and Hayden. In addition, oil and gas resources are scattered throughout the study area. This area is classified in some instances as industrial, but most of this usage is also classified as agriculture or rangeland. The settlement and industry base map available separately from this report shows the locations of oil and gas resources.

4. SETTLEMENT PATTERNS

The main settlements in the area are the incorporated communities of Craig, Meeker, and Hayden. These communities are properly referred to as urban places since they exhibit certain urban characteristics. Because of the existence of facilities and services and other urban amenities, these communities will bear the brunt of new settlement within the study area.

The three communities have the normal infrastructure; however, most of the existing facilities are adequate only for serving present population levels.

There are six jurisdictional governments within the study area. Three are county governments: Moffat, Rio Blanco, and Routt; the major portion of the study area is in Moffat County. The smaller communities of Lay, Maybell, and Hamilton are under the jurisdiction of county governments. The three incorporated communities--Craig, Meeker, and Hayden--function as typical municipal governments. Section IV details further the characteristics of these communities.

5. RECREATION

Recreation in the three counties encompassed by the study area is oriented primarily towards national and regional outdoor recreational uses such as hunting, skiing, camping, and fishing. Tourism, cross-country travelling, and sight-seeing are also important.

In Routt County, outside the study area, the Alpine Ski Terrain has been developed to accommodate 8,600 persons per day, and skier visits were up 17 percent from 1972 to 1973, and up 29 percent from 1971 to 1972 (BLM, 1973a).

Several national forests and primitive areas are within easy access of Meeker, Craig, and Hayden. These forests contain many year-round outdoor recreation activities and provide steady tourist revenue. The eastern portion of Rio Blanco County lies within the White River National Forest containing facilities for fishing, hunting, camping, hiking, and boating. The Flat Tops Primitive Area is located 50 miles east of Meeker within the White River National Forest. The Routt National Forest, lying astride the Continental Divide, is a region of watershed, trout streams, and alpine lakes and contains 39 camp and picnic areas. Saddle and pack trains frequent this area in the summer months.

The Dinosaur National Monument, comprising 209,744 acres in western Moffat County, 60 miles west of Craig, contains spectacular fossil remains. Canyons and rock formations have been formed by the Green and Yampa Rivers in the area. River boat trips and nature walks are available in the summer at the Split Mountain Gorge Campground.

Hunting is an important land use throughout the region. The majority of hunter days were for big game hunting. In the big game season in the fall, deer, elk, and occasionally bear are hunted. Antelope are hunted in September, mostly by local hunters.

ACTUAL
VISITORS
PER DAY?

effect of energy
development on
wildlife migration
patterns?

A good percentage of hunters are from the area; approximately 70 percent of the area's deer and elk hunters are residents of the county where they hunt. The percent of out-of-state hunters is unknown. The dependence of hunting on public land is assessed as follows: 70,688 of a total 201,967 hunter days were spent on public lands. In other words, approximately 35 percent of the hunting occurs on public lands (BLM, 1974). HUNTING
LICENSES

There is an abundance of lakes in the region offering excellent fishing and water sports. In addition to national and state areas, there are numerous other facilities such as Hart and Trappers Lakes, located 40 miles east of Meeker. Rio Blanco Lake is located west of Meeker and Lake Avery is in the Big Beaver Reservoir recreation area and offers water skiing and swimming. WATER
QUALITY

The proposed Elkhead Reservoir, to be constructed cooperatively by the State of Colorado and Colorado-Ute, will serve as a reserve for the two power generating units being built south of Craig. If constructed, the proposed reservoir will be managed by the Colorado Division of Parks. Elkhead is one of three reservoirs proposed in the Yampa Project. A smaller reservoir has been proposed on Fortification Creek. The third is the Juniper Project, southwest of Craig. It would impound the waters of the Yampa, covering the area from the dam at Little Juniper Mountain through Little Yampa Canyon into the Big Bottom area. The reservoir is to serve as a hydroelectric generating station. Another proposed reservoir is the Thornburgh, proposed as a Colorado River storage project to provide water largely for agricultural irrigation. A fourth proposal is the Pothook Reservoir in the Slater area. The National Park Service, scheduled to manage the reservoir area, has completed recreation data for the service area. E.I.S.!
WHERE?

Snowmobiling dominates the "dispersed winter recreational use" in the region. It contributed an estimated 38,500 visitor days for the 1972-1973 season. The most popular weekend use areas are National Forest Lands at higher elevations outside the study area. Heavily used areas were Buffalo Pass (east of Steamboat), Rabbit Ears Pass Road, and Stillwater Reservoir Road (BLM, 1973a).

Cross-country skiing is a major activity along Buffalo and Rabbit Ears Passes (between 10 and 60 skiers most weekends). An estimated 140 persons per week ski on Woodchuck Mountain and Copper Ridge, north of Steamboat. Cross-country skiing is found also in the Oak Creek area.

In 1973 and 1974, over 241,000 skier visitor use days were recorded at Steamboat, and an additional 8,900 were recorded at Stagecoach, both outside the study area. Craig's small beginner area, Cathy Cisar Hill, is used mainly by the town's youth.

E. AREA SPECIFIC PHYSICAL CONSIDERATIONS

Eleven specific areas of least environmental impact were delineated by the composite mapping process; six of these areas were chosen for further study due to their location relative to major transportation routes and prime mineral areas. The remaining five areas were reviewed in less detail. In addition, the communities of Craig and Meeker were reviewed in terms of expansion potential since the cellular mapping process excluded these communities due to the majority of existing development within the sections. These thirteen areas are randomly numbered and named as listed below:

Area 1	Craig
Area 2	Meeker
Area 3	Maybell
Area 4	Jesse Gulch
Area 5	Morgan Gulch
Area 6	Axial
Area 7	Sand Spring
Area 8	West Craig
Area 9	Central Craig
Area 10	Ralph White
Area 11	Cedar Hill
Area 12	Bald Mountain
Area 13	Kellogg Gulch

To supplement the mapping process, a fatal-flaw area investigation (or walkover) was conducted to assure that the chosen areas were acceptable for community development. This information, combined with the regional socioeconomic analysis, as given in Section IV, determined the degree to which each of these sites would interrelate with the regional infrastructure. The conclusions of this study are given in Section II. The following portion of this report briefly describes each of the thirteen sites in terms of the physical, biological, and land use compatibility. Refer to Figure 9 for site locations.

1. AREA 1 - CRAIG

The computer mapping process did not delineate areas for possible development smaller than a section. The developable portions within the city limits of Craig were added to the study because these properties are prime development areas and should be considered for their immediate development potential.

a. Geology and Soils

Slope gradients within the city limits vary, ranging from 0 to 15 percent. Soils are primarily sandy loam, over 60 inches deep, with fair organic content in the upper horizons. Parent materials for the soils are loess, the Lewis Shale, and the Lance Formation. The interbedded sandstone and shale of the Lance Formation have weathered to form a sandy loam with good drainage and fair to good water retention capacity. There should be little problem in developing the open areas of the community in terms of geology and soil suitability, although each potential site should be reviewed in more detail.

b. Air Quality

The climate is semi-arid steppe with an average temperature of 42°F. Precipitation averages 13.4 inches a year and snowfall averages 62 inches a year. Inversions occur 60 percent of the time, especially during winter months. The mean depth of the stable layer is 1,100 feet and is affected by a valley wind flow. Air quality currently is as follows:

Particulates	67 mg/m ³
SO ₂	0.0019 p.p.m.
NO _x	0.04 p.p.m.

Major sources for these emissions are automobiles and the Hayden electrical power plant.

The Colorado-Ute electrical power plant should not significantly affect the air quality around Craig. The valley wind flow should carry emissions to the southwest of the community.

Assuming that 100 units will be constructed within Craig, resulting in a population of approximately 300 persons per 100 units and 1.8 vehicles per unit with an average driving distance of 26 vehicle miles per day, the following emission estimates for space heating and vehicular emissions are as follows:

Particulates	0.7 tons per year
SO ₂	0.5 tons per year
CO	108 tons per year
HC	7 tons per year
NO _x	11 tons per year

This gives an indication of particulates and gaseous pollutants emitted due to population increase from housing development per 100 units.

Since vehicular traffic causes most of the emissions from residential development, mitigation measures should be directed at reducing the vehicle miles traveled. A bus system should be established from the city to and from proposed mining developments in order to reduce air quality deterioration.

c. Water

To the south of Craig lies the Yampa River and Flood plain. No other major surface waters exist within the Craig city limits. Generally, the ground water availability is poor, ranging from 1 to 10 gpm. The city's water supply comes from the Yampa River; further discussion is given in Section IV, Part D, "Housing and Capital Facilities."

d. Vegetation and Wildlife

Since Craig is a developed community, vegetation and wildlife are comprised of introduced vegetative communities, domesticated animals, feral dogs and cats, exotic or introduced wildlife and aboreal or minority wildlife species. Deer and elk frequent pasturelands surrounding the city, primarily during winter months. The vegetation that exists on undeveloped properties is primarily sagebrush and grasses.

e. Antiquities

Archaeological, paleontological and historic resources are reviewed on a site specific basis prior to land alteration. Within the Craig city limits, the potential exists for sites of historical significance since the community has been established for many years. Should the undeveloped portions of Craig be considered for community development, the property or properties should be surveyed prior to any land alterations.

f. Development Potential

Of all the communities within the Study Area, Craig will probably be the community most severely impacted by population growth. The potential for this community to absorb growth is covered in the following section. Within Craig there are several parcels of land which have been zoned for residential development and which are also serviced by existing water and wastewater systems. These parcels would be the most easily developed at this time. Any development occurring at or beyond the Craig city limits will require expansion of water and wastewater facilities which will add to the development costs. See Section IV, Part D, for further discussion.

2. AREA 2 - MEEKER

a. Geology and Soils

The topography slopes southward at a 4 to 8 percent gradient. The soils comprise two major types: highly expansive, slowly permeable clay loam, and a moderately permeable, slightly expansive loam. Parent materials for the soils are alluvium and Pierre Shale in the case of the expansive clay loam; and loess, Mancos Shale, and the sandstone and shale units of the Illes Formation for the less expansive loam. Expansive clay loam has a tendency to slump and slide. Further soils studies will have to be conducted to determine the engineering characteristics of the soil.

b. Air Quality

The climate is semi-arid steppe with an average yearly temperature of 44.4°F. Precipitation averages 17.68 inches a year; snowfall averages 91.5 inches a year. Inversions are frequent especially during the winter. There is some possibility of pollutants being trapped against surrounding ridges during stagnation periods. The general air quality is good, with a particulate count of 56 g/m³. Assuming a development of 400 units, an incoming population of 1,200 persons, 1.8 vehicles per dwelling unit and an average distance travelled of 26 miles per day, the emission estimates are as follows:

Particulates	3.02 tons per year
SO ₂	1.82 tons per year
CO ₂	4.33 tons per year
HC	27.3 tons per year
NO _x	44.3 tons per year

c. Water

The upper drainage area is approximately one-half square mile which channels along the west and east side of the property. No streams are on-site. Ground water availability is good, with a test well north of the project site drawing 500 to 700 gpm. Ground water quality is good; 400 parts per million (ppm) of total dissolved solids (TDS) compared with 240 TDS at the upstream intake of the White River water supply. Ground water table elevation is approximately 125 feet. There are approximately 11 to 50 registered wells within the township.

d. Vegetation and Wildlife

Over 50 percent of this area is occupied by relatively undisturbed oak-serviceberry and pinyon-juniper communities. The remaining area contains either sagebrush and/or grasses available for grazing. Intense urban development would not be practical on the steep slopes where the pinyon-juniper occurs. Modification on the sagebrush grassland would not eliminate important or unique vegetation. It will be necessary to irrigate in order to establish and maintain vegetation desirable for urban development.

This area is used for winter range for deer; however, the number of individuals using this area is low. Elk normally do not utilize this area; use would be accidental in nature.

e. Antiquities

There are no archaeological, paleontological sites currently recorded northwest of the Meeker city limits. Because of the Thornburgh Battle and other noted uses of this area by the Ute Indians, this area may yield some artifacts. There would be some potential for this area to have been used as a dump or burial grounds. An antiquities survey would be recommended.

f. Development Potential

Meeker is a much smaller town than Craig and does not have the level of community and commercial services available. It is a predominantly rural-agricultural community and tends to be very hesitant to accept intruders. The town governing bodies though, realize the impact coal and oil shale will have on their community and have been progressive in terms of preliminary planning.

The majority of the community wants to continue to be agriculturally oriented. Strong zoning is now being instituted to encourage growth to the northwest of the city limits out of the agricultural areas. The delineation of the Meeker study area by VTN was made with this community goal in mind.

In a recent public opinion survey conducted by the City of Meeker, a large majority of those surveyed indicated that mineral-related developments should carry the costs of facility expansion if mineral companies are going to house employees in their community. The town and county planners agree with public opinion and are taking the necessary steps in this regard.

3. AREA 3 - MAYBELL

a. Geology and Soils

Slope gradients are fairly level throughout the area, falling within the 6 to 10 percent and the 11 to 15 percent ranges. The parent materials for the soil on the entire area is the Browns Park Formation.

b. Air Quality

The climate is semi-arid with temperatures ranging from 40° to 45°F. Precipitation ranges from 10 to 16 inches a year with a snowpack persisting most of the winter. Inversions are frequent during the winter with winds eddying around Juniper Mountain. Air quality is good with particulates averaging 10 to 50 mg/m³. There are no major emission sources. See Area 1, Craig, for estimated sources emissions caused by community development.

c. Water

No perennial streams are found in this area. Deception Creek is the major drainage corridor to the Yampa River. Information regarding ground water availability and quality is limited. USGS data suggest that up to 50 gpm are available to properly constructed wells in non-alluvial areas. Stream valleys would be expected to yield greater quantities of water.

d. Vegetation and Wildlife

This area is predominantly cropland and sage-grassland with some riparian vegetation along Deception Creek. Scattered clumps of oat and juniper occur on cooler slopes. This area is used for sheep and cattle grazing.

Large antelope herds are year-round residents in the Maybell vicinity. Deer numbers are minimal and no elks are found. Maybell is to the south of the major migration routes of the northern herds which come to the southern portions for winter grazing. There are raptors along the Yampa River areas, predominantly hawks and falcons. No rare and endangered species have been spotted.

e. Antiquities

The Maybell region has no recorded archaeological, paleontological, or historic sites; however, it has a potential for isolated site locations along the Yampa River. The riparian areas should be surveyed prior to development.

f. Development Potential

Maybell is a possible consideration for community development. The town, located on the northern border of the area on Highway 40, can facilitate a population of 1,000 persons (current population is approximately 450). Maybell is located between Vernal, Utah, and Craig, Colorado. Vernal is expected to become a major oil shale development area. If so, there will be substantial travel along Highway 40 between Denver and Vernal. Maybell is also connected to Meeker by a partially developed road. Should this road be improved, it would link Maybell and Meeker and would allow interaction between these two towns. This road also bisects a substantial portion of mineral developments.

4. AREAS 4,5 AND 6 - JESSE GULCH, MORGAN GULCH, AND AXIAL AREAS, RESPECTIVELY

(Areas 4,5 and 6 were grouped together because they have common characteristics).

a. Geology and Soils

Areas 5 and 6 have surficial deposits that dip to the northeast with a 1 to 2 percent overall gradient. Soils are organically poor loam to clay loam, with depths of over 60 inches. Over 20 feet of unconsolidated alluvium underlies the flood plain portions of the areas. Area 4 is characterized by a slope gradient of 0 to 12 percent, with organically poor and sandy soil exhibiting depths of over 60 inches.

All three areas have portions with high erosion potential. Clay soils on areas 5 and 6 exhibit portions of high expansiveness.

b. Air Quality

There is no specific climatological data available for the area

surrounding Morgan Gulch; however, an attempt has been made to describe the climate from extrapolated data. The mean annual temperature will probably be in the range of 40° to 45°F. Precipitation will vary from 10 to 16 inches per year. The predominant surface winds will generally reflect a southeast-northwest pattern in the Axial Basin due to up-and-down-valley flows; however, these winds are locally controlled by the surrounding topography. Some airflow down Morgan and Straight Gulches will join the basin flow in the area, generally during the winter months.

The air quality of the areas is considered good; however, there is no supportive air monitoring data to confirm this. Particulate levels are expected to be typical of rural areas and in the range of 10 to 40 micrograms per cubic meter of air. There are no emission sources with the exception of occasional vehicle traffic on the unpaved roads through the general vicinity.

c. Water

Three north flowing creeks traverse the Axial area; Wilson, Good Spring, and Milk Creeks. Preliminary water quality investigations of these creeks by VTN indicates that the overall quality of these waterways is good for domestic use. The quantity of flow from these waterways is also being determined by VTN and the USGS and should be available in the fall of 1975. Three sections in the central portion of the area are subject to flooding from these creeks.

Adequate ground water supply from the large alluvial deposits of the flood plains of Good Spring Creek, Wilson Creek and Milk Creek should be considered a good potential source of water for a new community development. No pump tests have been run on water wells developed in this alluvium. Water quality of the shallow ground water can be expected to be equivalent to the quality of the overlying surface streams.

d. Vegetation and Wildlife

The three areas are all on the slightly sloping floor of the Axial Basin. The entire area is occupied by sagebrush grassland; croplands exist throughout the area. Limited communities of aquatic vegetation occur along the creek bottoms, while oak-serviceberry and pinyon-juniper are found on the upper

edges of each area.

Urban development would remove available cropland and grazing land from production. The effect upon riparian and woodland areas would be negligible. Irrigation will be necessary to establish and maintain trees, grasses, and other urban vegetation.

All three areas are located in key deer migration routes. Large numbers of deer also winter in the area. Elk do not migrate through the area, although some winter close to the respective sites. Their numbers are increasing, which could ultimately result in problems to any nearby community.

Antelope are year-round residents of the general area associated with the three sites. Few mountain lion have been sighted in the area; however, their range and exact activities are not known. There are high numbers of sage grouse in the area. Development would result in displacement brought about by the removal of strutting grounds. Numerous raptors utilize the area, including prairie falcons and on rare occasions, peregrine falcons.

Development of any of these three areas would have serious impacts on key winter range and migration routes.

e. Antiquities

There are no archaeological, paleontological or historic sites presently located on this property. In this area, however, there is a high potential for the presence of artifacts remaining from open campsites, bordering sites, rock and chipping stations and rock shelters. These would remain from early explorers or Indians since this area is situated near trails. There is a possibility of fossils associated with the Browns Formation or Quaternary fossils under the right conditions. A survey of the area would be recommended prior to development into residential use.

f. Development Potential

These three areas have both beneficial as well as detrimental characteristics. They lie midway between Craig and Meeker and are located in the heart of the mineral development area. Should a new community be considered, one of these three may be applicable. Axial, Area 6, would probably be the most suitable since it is adjacent to Highway 13-789. The negative aspects of these three areas would be the lack of water and

wastewater facilities and other community services, the costs associated with the provision of these facilities, and the negative impacts to established deer and elk migration routes.

5. AREA 7 - SAND SPRING GULCH

a. Geology and Soils

The topography of the area is rolling, with 60 percent of the slope gradients within the 0 to 12 percent range and another 30 percent in the 12 to 15 percent range. The soils are organically poor loam to clay loam, with depths of over 60 inches. Soil areas of high shrink-swell potential, low permeability, and high clay content should be expected. A rigorous soils investigation should be performed to ascertain the soil mechanics and engineering properties of the surface materials prior to the development of this property.

b. Air Quality

Rainfall averages about 14 inches per year with about 62 inches of annual snow. There are no major sources of air quality degradation in the area, although there is a possibility of being affected by the Colorado-Ute power plant plume in Craig. There are inversions on 60 percent of the days during the winter months.

c. Water

The area is located at the upper end of the watershed and thus the flooding potential is minimal. Fuhr Gulch and Sand Spring Gulch traverse the area in a southwesterly direction. Quantities of dependable surface water or information on water quality is not known at this time.

Ground water availability is poor with an estimated well yield of less than 10 gpm. Chemical water quality is good to fair for domestic use. A ground water exploration program should be initiated to gather more definitive information should this area be considered for development.

d. Vegetation and Wildlife

This area is 90 percent ranchland used primarily for dryland farming and intensive cattle grazing. Areas not used for agriculture are covered by sage-grassland. Urban development in this area would remove crop and rangeland from productivity. Irrigation would be necessary to establish and maintain urban vegetation.

There are no big game species utilizing the area to any great extent. Since agricultural use has already reduced the desirability of this area for wildlife, the impacts of development would be minimal.

e. Antiquities

The Sand Spring Gulch area has characteristics similar to those of Axial, Jesse Gulch and Morgan Gulch areas. It is also a possible Indian trail site because it is near the river. River beds were a popular trail location because Indians and early settlers were able to find a variety of food and water nearby as they travelled. An antiquities survey is also recommended for this area since there will be the potential for sites despite subsequent changes in the river bed, habitation patterns, and agricultural development.

f. Development Potential

The development of a new community in this area would not be recommended since it will conflict with the City of Craig; however, its potential for a multiple-use planned urban development may be complementary as the area is close enough to Craig to become a future suburb community. Its location adjacent to the new reservoir (provided the Juniper Dam is built) will cause the land to become more valuable economically and more favorable as a recreation area. There will be costs involved, however, which may prohibit this area from immediate development. Access problems will be great since traffic origin-destination points will be to the south. Without a more direct highway involving a new river crossing, getting to and from the area would involve excessive travel, and because of its distance to Craig, would require new community services. With these factors in mind, it is recommended that this site be examined more closely in terms of future PUD development.

6. AREA 8 - WEST CRAIG

a. Geology and Soils

Most of the topography in this area, or 60 percent, lies within the 0 to 12 percent slope gradients, and another 30 percent falls in the 12 to 25 percent range. Soils are organically poor loam to clay loam with depths of over 60 inches. Soil areas of high shrink-swell potential, low permeability and high clay content should be expected. A rigorous soils investigation should be performed to ascertain the soil mechanics and engineering properties of the surface materials prior to the development of this property.

b. Air Quality

Rainfall averages about 14 inches per year, with about 62 inches of annual snow. There are no major sources of air quality degradation in the area, although there is a possibility of being affected by the Colorado-Ute power plant plume in Craig. There are inversions during 60 percent of the winter months.

c. Water

Pine Ridge Gulch and Bogenschutz Creek traverse this area northwesterly to southeasterly and drain to the Yampa River. The watershed drainage area of these creeks is approximately 15 square miles. One spring is visible on the western section of the property and a one-acre pond with Pine Ridge Gulch is located on the eastern section of the site. Surface water quality is unknown.

Known ground water yields are reported to be between 11 to 50 gpm in two sections of the site and between 1 to 10 gpm in the remainder. Water quality is reported to be good to fair. There are two known water wells in the area.

d. Vegetation and Wildlife

This area is used as ranchland (dryland, irrigated, and grazing) with limited riparian areas near the Yampa River. Urban

development would remove ranchland from production and destroy riparian areas. Irrigation would be necessary to establish and maintain urban related vegetation.

There is little utilization by any species of wildlife. Since agriculture has already reduced the desirability of this area for wildlife, the impacts of development would be minimal.

e. Antiquities

This area has some potential for antiquities, which would be located probably near the creeks. Campsites, chipping areas and butchering sites would be the most likely finds. A survey should be conducted prior to development.

f. Development Potential

This would be a good location for a planned urban development (PUD) if utilities could be brought from Craig. For site enhancement reasons, boundaries of this area should be expanded. In the first instance, there is need to control the area between the easterly boundary and State Highway 13-789 (Craig to Axial). For the most part, this additional area encompasses the development once proposed by Moffat County Development Corporation.

Secondly, the developer would need to control highway access along Highway 40 east and west of the site to prevent strip commercial development. This has particular application in the stretch of highway between this development and the City of Craig.

The area affords ease of access to the south without having the cost of major access construction. Quite possibly, water supply could be furnished by the City of Craig. On the other hand, independent sewage disposal would be necessary to avoid excessive sewage transport costs.

The use of the area for urban services would not adversely affect agricultural production. Mineral resources are not involved, and use of the area would not detract from existing recreational services.

If the area generally between this parcel and the Yampa River were added, the land east of Highway 13-789 and south of Highway 40 should be subject to limited development. Actually, much of this area is prime agricultural land (hay farming) and provides a decided aesthetic value for the general area.

In terms of location and existing amenities, this area provides a good site for satellite or PUD development. Because of its location, it is highly probable that portions of this area will be developed in the future. A planned development under one ownership with adequate provision for the necessary services and amenities could insure a quality development that could become the focal point of the region.

Note: An area-specific survey was not conducted on the remaining five areas. These were either too far from the Colowyo Mine site, did not have existing access to the area, or, in some cases, had characteristics that negated consideration for community development at this time.

7. AREA 9 - CENTRAL CRAIG

Because of its location relative to Craig and to Highway 13, this area would normally be a prime location for community development. From preliminary investigations, this area was deleted in terms of on-site investigations at this time for the following reasons:

- This site is traversed by the Yampa River. The floodplain covers approximately 25 percent of the site, which would negate this area for development without major flood control improvements which would be cost prohibitive.
- Under adverse meteorological conditions the stack emissions from the Colorado-Ute power plant will be carried over the southern portion of the site, creating either at the minimum, undesirable aesthetic conditions, or at the maximum, serious air quality conditions. The stack emissions are dependent upon the efficiency of the air quality control devices, which, until the plant becomes operational, cannot be determined.
- Both the Colorado-Ute spur line and the proposed railroad line will traverse this property, which may render it more suitable for commercial, industrial, or recreational development than residential or community development.

Because of the location of this area relative to the City of Craig, it should depend on the existing community utility facilities.

However, these services do not extend as far west as needed. Those utility systems existing to the western limits of the city are at capacity and no new hook-ups are available. To provide utility services to this area would require either expansion of existing facilities which may be cost-prohibitive, or an independent system which in all probability would not be allowed due to the area's close location to the city limits. Development, for this reason, should not be considered in the immediate future but should be reconsidered as the city limits of Craig are expanded.

- There are more suitable locations for development within the study area which do not have problems similar to those listed above.
- The northern portion of the property to the south and west of Highways 40 and 13-789 is currently owned by the Moffat County Development Corporation which had planned to construct a development consisting of mobile home units, townhouse and single-family dwelling units. Because of financial difficulties and inability to acquire building approval, the project has been abandoned for the present. There is some probability that this land may be offered for sale by the developers. If so, its potential for development should be reviewed.

8. AREAS 10 AND 11 - RALPH WHITE AND CEDAR HILL

These areas are located to the northeast of Craig and are near the Ralph White State Recreation Area. Highway 789 bisects the two areas and connects Craig with Baggs and Rock Springs, Wyoming. Estimated driving time to the Colowyo Mine site is 40 miles. These two areas were deleted from consideration primarily because of the distance from the Colowyo Mine site.

9. AREA 12 - BALD MOUNTAIN

The Bald Mountain area lies north of Meeker and is not connected by an improved road. This area is extremely remote from the major mineral development areas and, therefore, is not a viable development site.

10. AREA 13 - KELLOG GULCH

The Kellog Gulch area is located approximately 15 miles west of Meeker. It is surrounded by oil shale and natural gas deposits and is adjacent to the Rio Blanco Lake State Recreational Area. This area contains only one square-mile section which does not have underlying mineral deposits. Due to its mineral potential, distance from the Colowyo Mine site and its location near Meeker, it was not ranked as a viable development site. It should be noted also that to the south of Meeker a new town site is being considered by ARCO which will draw oil shale development population.

IV. REGIONAL SOCIOECONOMIC CONSIDERATIONS

A. INTRODUCTION

Socioeconomic considerations have been developed in relation to three major purposes. The first purpose is to examine what economic growth might be expected in the Tri-County Region in addition to the energy-related development that is presently occurring in the area. This is combined with the impact analysis of the energy-related developments to gain an impression of the fundamental economic forces that will be operating in the region over the next decade. These forces will determine the extent to which there will be growth in regional employment and population in the future, where this growth is likely to occur, and the probable phasing of growth over time. All of this will strongly condition the extent and nature of the demands on existing or possible new communities in the Tri-County Region.

The second purpose is to identify the constraints that will affect the ability of the region to absorb growth. Principal among these constraints are the housing and public facility capacities of the existing towns in the region. These are examined both to assess present capacities and to identify any unusual conditions that might preclude or make it difficult to expand existing capacities.

The third purpose will be to assess the projected impacts of the Colowyo Mine and to develop estimates of the appropriate income and employment multipliers. Development forecasts are presented which integrate the impact from the Colowyo Mine with other sources of impact in the Tri-County Region. These scenarios project employment, population, and the distribution of population among communities under various assumptions regarding oil shale development and the establishment of a new community in the region. Realizing that estimating is the most tangible aspect of this study and that existing forecasted conditions will change rapidly, the forecasts were developed to be as flexible as possible and to allow for reevaluation as new information becomes available. The bibliography, Section VI, contains a listing of the background information used in this section.

B. THE ECONOMIC BASE OF MOFFAT, RIO BLANCO AND ROUTT COUNTIES

1. EXISTING CHARACTERISTICS

The draft environmental impact statement prepared by VTN for the Colowyo Mine describes historical population and employment trends in the Tri-County area in considerable detail. These data are summarized at a highly aggregated level, but despite the aggregation, the impression conveyed is an appropriate and valid one. The Tri-County Region, like much of the rural Rocky Mountain area, had not experienced any overall growth in employment or population over the past two decades. All of this has, of course, radically changed since 1973, but in order to adequately assess the region - wide implications of these recent changes, it is necessary to take a closer look at the non-energy related economic base of the region.

POPULATION AND EMPLOYMENT IN THE TRI-COUNTY REGION, 1950 to 1970

	1950	1960	1970
Population	19,605	18,111	17,959
Employment	7,219	6,699	6,976

SOURCE: Department of Commerce, Bureau of Census.

In discussing economic activity, the distinction between basic and non-basic and between direct and indirect activities should be clarified. An activity is considered to be basic to an area if the source of the demand for its output is independent of economic conditions within the area. In other words, the market for basic commodities or services depends on factors external to the area. Agriculture, mining, tourism, much of manufacturing, and some state and federal government employment are examples of the most important components of the base of most regions. Non-basic sectors include those activities that arise in response to the demand occurring within a region. These are related to both the population and income of the region and would include much of the employment in the trade and service sectors.

A further distinction of activities is necessary, however, because some goods are sold directly to the final purchaser, while others go through a series of local inter-industry transactions. For example, agricultural co-op selling, seed, fertilizer, etc., to local farmers should be considered part of the basic sector because the agricultural production to which it contributes is sold in response to national demand conditions. Because the sales are to another producer, however, the co-op would be classified as indirect basic (sometimes referred to as linked) while the rancher selling grain to a mill would be classified as direct basic. Exactly the same distinction exists in the non-basic sectors. Some sales are made directly to consumers, while others are made to firms that service the local market. Thus, a medical doctor or a dry-cleaning establishment would be categorized as direct non-basic, while a food wholesaler would be indirect non-basic.

These distinctions are very important because it can be shown that the total amount of economic activity in a region will be determined by the amount of basic activity (both direct and indirect) occurring in the region. The quantitative relationship between basic and total activity is called the multiplier. If the multiplier were 1.8 and basic employment were 10, then total employment would be 18. This would imply that there are 0.8 non-basic jobs created for every basic job. The multiplier process will be examined in more detail later in this chapter.

Table 16 presents detailed employment data for each of the three counties and for the region as a whole for 1960 and 1970. It is clear from the table that the base of the economy was rooted firmly in agriculture and mining during that period. Between 1960 and 1970, however, this base declined. Total employment in the region in these two sectors fell from 33 percent of total employment in 1960 to 23 percent in 1970. The only other significant basic activity in the region is tourism, but this sector is much more difficult to analyze because the tourist-serving component of the service trades has to be separated from the non-basic component of these sectors. The intricacy of the problem can be appreciated by considering the difficulty of separating out the tourist business from the local business in the restaurants, bars, service stations, etc., of the region. The tourist-related component of the base is over-estimated since all of the employment in the eating, lodging and automobile service industries has been included. Given the negligible change in population in the region, however, the non-basic portion of these sectors should remain approximately constant, and the change in the total can be interpreted legitimately as a change in tourist-related employment. The total decreases in basic activity in Moffat and Rio Blanco Counties are

TABLE 16
EMPLOYMENT BY SECTOR FOR THE COUNTIES OF THE TRI-COUNTY REGION

	Moffat County					Rio Blanco County					Routt County					Tri-County Region					Absolute Change 1960-70	Percent Change 1960-70
	1960	Percent Total	1970	Percent Total	Absolute Change 1960-70	1960	Percent Total	1970	Percent Total	Absolute Change 1960-70	1960	Percent Total	1970	Percent Total	Absolute Change 1960-70	1960	Percent Total	1970	Percent Total			
Labor Force	2,834	100.00	2,622	100.00	-212	2,094	100.00	1,981	100.00	-113	2,093	100.00	2,607	100.00	514	7,021	100.00	7,210	100.00	189	2.69	
Unemployed	148	5.22	119	4.54	- 29	81	3.87	35	2.06	- 46	93	4.44	80	3.07	- 13	322	4.59	234	3.25	- 88	- 27.32	
Total Employed	2,686	94.78	2,503	95.46	-183	2,013	96.13	1,946	97.94	- 67	2,000	95.56	2,527	96.93	527	6,699	95.41	6,976	96.75	277	4.13	
Agriculture	399	14.85*	351	14.00*	- 48	332	16.49*	294	15.11*	- 38	507	25.35*	362	14.33*	-145	1,238	18.48*	1,007	14.44*	-231	18.66	
Mining	402	14.97	124	4.95	-278	401	19.92	280	14.39	-121	187	9.35	175	6.93	- 12	990	14.78	579	8.29	-411	41.52	
Construction	263	9.79	294	11.75	31	156	7.75	152	7.81	- 4	126	6.30	232	9.18	106	545	8.14	678	9.72	133	24.40	
Manufacturing	102	3.80	42	1.68	- 60	47	2.33	42	2.16	5	63	3.15	95	3.76	32	212	3.16	179	2.57	- 33	15.57	
Transportation	123	4.58	63	2.52	- 60	91	4.52	32	1.64	- 59	87	4.35	111	4.39	24	301	4.49	206	2.95	- 95	31.56	
Communications	25	.93	34	1.36	9	22	1.09	0	0.00	- 22	17	.85	19	.75	2	64	.96	53	.76	- 11	17.19	
Utilities and																						
Sanitary Services	25	.93	88	3.52	63	44	2.19	62	3.19	18	65	3.25	98	3.88	33	134	2.00	248	3.56	114	77.61	
Wholesale Trade	60	2.23	127	5.07	67	29	1.44	53	2.72	24	30	1.50	26	1.03	- 4	119	1.78	206	2.95	87	73.11	
Retail Trade	525	19.55	501	20.02	- 24	217	10.78	219	11.25	2	291	14.55	515	20.38	224	1,033	15.42	1,235	17.70	202	19.55	
Eating and Drinking	101	3.76	82	3.28	- 19	29	1.44	42	2.16	13	83	4.15	152	6.02	69	213	3.18	276	3.96	63	29.58	
Motor Vehicle and																						
Service Stations	80**	2.98	141	5.63	61	33**	1.64	29	1.49	- 4	44**	2.20	110	4.35	66	157**	2.34	280	4.01	123	78.34	
Other	344	12.81	278	11.11	- 66	155	7.70	148	7.61	- 7	164	8.20	253	10.01	89	663	9.90	676	9.69	13	1.96	
Finance, Insurance,																						
Real Estate	46	1.71	54	2.16	8	39	1.93	56	2.88	17	46	2.30	63	2.49	17	131	1.96	173	2.48	42	32.06	
Business and Repair																						
Services	81	3.02	95	3.79	14	79	3.92	64	3.92	- 15	52	2.60	57	2.26	5	212	3.16	216	3.09	4	1.89	
Personal Services	194	7.22	166	6.63	- 28	142	7.05	99	5.09	- 43	112	5.60	217	8.59	105	448	6.69	482	6.91	34	7.59	
Private	32	1.19	7	.28	- 25	76	3.78	31	1.59	- 45	26	1.30	29	1.15	3	134	2.00	67	.96	- 67	- 50.00	
Hotel and Motel	50***	1.86	42***	1.68	- 8	36***	1.79	25***	1.28	- 11	29***	1.45	56***	2.22	27	115***	1.72	123***	1.76	8	6.96	
Other	112	4.17	117	4.67	5	30	1.49	43	2.21	13	57	2.85	132	5.22	75	199	2.97	292	4.19	93	46.73	
Entertainment and																						
Recreation	8	.29	31	1.24	23	19	.94	22	1.13	3	22	1.10	38	1.50	16	49	.73	91	1.30	42	85.71	
Health	34	1.27	149	5.95	115	30	1.49	121	6.22	91	25	1.25	22	.87	- 3	89	1.33	292	4.19	203	228.09	
Education	163	6.01	199	7.95	36	117	5.81	233	11.97	116	180	9.00	288	11.39	108	460	6.87	720	10.32	260	56.52	
Welfare	21	.78	18	.72	- 3	14	.69	24	1.23	10	16	.80	32	1.27	16	51	.76	74	1.06	23	45.10	
Professional Services	63	2.35	31	1.24	- 32	42	2.09	40	2.06	- 2	33	1.65	57	2.26	- 24	138	2.06	128	1.83	- 10	- 7.24	
Public Administration	96	3.57	136	5.43	40	81	4.02	153	7.86	72	77	3.85	110	4.35	33	254	3.79	399	5.72	145	57.09	
Other—Not Reported	56	2.08	****			111	5.51	****			64	3.20	****			231	3.45	****				

* Numbers in percent of total column for each specific employment category are the percentage of total employed, not of total labor force.
 ** Estimated as .1523 of total Retail Trade Employment, the proportion in Colorado.
 *** Estimated as .2570 of total Personal Services Employment, the proportion in Colorado.
 **** Not reported in 1970 census data.

Sources: 1960: Colorado 1960 Census of Population, Vol. 1, Part 7, Table 85.
 1970: Colorado 1970 Census of Population, Vol. 1, Part 7, Table 123.
 Estimates made by Mountain West Research based on 1970 census.

extremely large, but Routt County managed to remain stable due to the growth of the ski industry outside of Steamboat Springs. Table 17 summarizes the changes in these three major sectors.

The relationship between basic and non-basic employment may not be as rigid as is often believed. As Tables 16 and 17 show, between 1960 and 1970 the major components of basic employment fell by 445 jobs while total employment in the region increased by 277. There are probably two fundamental causes of the changed relationship of basic to non-basic employment over the 1960s. First, there has been an increase in the number of non-basic to basic employees throughout the United States. Employment in sectors like health, public administration, welfare, education, etc., has increased at a proportionately lighter rate than population growth. Second, much of the decreased local demand for goods and services may have been absorbed by the local trade and service sectors in the form of excess capacity and under-employment rather than a decrease in measured employment. Although less is known about the process of economic decline than about growth, it would not be surprising to discover that very large decreases in business were necessary to actually eliminate employment in the non-basic sectors of rural areas. Alternatives are not likely to be numerous for these people and part-time employment (in terms of wages and effort required) is better than no employment.

a. Mining

Mining has been of importance historically in the Tri-County Region although there was a substantial decline in its importance from 1960 to 1970 as was shown in the aforementioned tables. In Table 16, it can be seen that mining actually employed more persons than agriculture in 1960 in Moffat and Rio Blanco Counties, but by 1970 it had become a substantially smaller sector of the regional economy. As a percentage of total employment in the Tri-County Region, mining fell from 15 percent in 1960 to only 8 percent in 1970. By 1972, there were only seven operating mines in the region producing a total of less than three million tons per year; this is less than that which is expected to be mined by Colowyo Mining Company at maximum development of its surface mining activities in 1977.

TABLE 17

	Moffat			Rio Blanco			Routt			Tri-County Region		
	1960	1970	Change	1960	1970	Change	1960	1970	Change	1960	1970	Change
Mining	402	124	-278	401	280	-121	187	178	-9	990	582	-408
Agriculture	399	351	-48	332	294	-38	507	362	-145	1,238	1,007	-231
Tourism-Related*	231	265	+34	98	96	-2	156	318	+162	485	679	+194
TOTAL			-292			-161			+8			-445

* Equals the sum of Eating and Drinking, Motor Vehicle and Service Stations, and Hotel and Motel.

SOURCE: Derived from preceding Table.

b. Agriculture

According to the 1969 Census of Agriculture, the total market value of all agricultural products from the Tri-County Region was \$42,003,400. Of this total, 80 percent was attributed to the sale of livestock, principally cattle, and to the sale of wool. Livestock continues to play the dominant role in the regional agricultural sector, but recent price fluctuations have been so large that valuation data must be interpreted cautiously.

Unfortunately, livestock valuation data are not directly available for the years since 1969 for the Tri-County Region. Reasonable estimates can be made, however, based on state-wide data. Table 18 shows beef and wool production, price, and cash receipts for the State of Colorado as well as for the study region. Using the Colorado cash receipts data to estimate tri-county cash receipts for cattle and calves requires the assumption that prices received are equal to those received elsewhere in the state and that weight-per-head is comparable to the state average. These data can then be summarized in terms of percentage changes experienced over the 1970 - 1973 period, as shown in Table 19. The table clearly illustrates that it has been price increases, not production increases, that have increased the value of cattle and calves output over the past three years. It is essential to separate the price from the quantity effects because only quantity effects will generate increased basic employment. Thus, there is nothing in Table 19 that would suggest a reversal of the 1960-1970 trend in agricultural employment. It must be kept in mind, however, that even though direct employment in the agricultural sector may not increase, if agricultural income increases substantially because of price increases to such an extent that farmers increase their spending, more employment will be generated in the non-basic sectors. This may be a contributing factor to the anomaly discussed above of total employment increasing in the face of decreases in basic employment.

It is interesting that there is an apparent low elasticity of livestock supply in the face of large price increases. Despite an increase in beef prices of 54.2 percent from 1970-1973, the production of meat from cattle and calves increased only 4.6 percent. The reasons for this are unclear, although the large price increases of cash crops that occurred over the same period may have contributed in two ways. First, the cost of feeding cattle increased substantially, and, second, some land, labor, and/or machinery may have been converted from cattle production to crop production. Cash valuation for leading crops is given in Table 20.

TABLE 18
BEEF AND WOOL PRODUCTION, CASH RECEIPTS AND PRICE,
1970 AND 1973:
COLORADO AND TRI-COUNTY REGION

	1970		1973	
	Beef	Wool	Beef	Wool
<i>Production</i> (in thousands of pounds)				
Colorado	1,636,058	10,955	1,799,875	11,354
Tri-County Region	59,085	2,005	61,817	1,828
<i>Valuation</i> (in thousands of dollars)				
Colorado Cash Receipts	\$793,256	\$3,615	\$1,364,933	\$9,310
Estimated Tri-County Cash Receipts*	\$ 28,648	\$ 662	\$ 46,879	\$1,499
Colorado Average Price	\$29.38/cwt. **	\$.33/lb.	\$45.31/cwt. **	\$.82/lb.

* Tri-county cash receipts are estimated equal to the ration of Colorado cash receipts divided by Colorado production times tri-county production.

**Prices derived by dividing total receipts by hundred weight on the hoof. Therefore, this figure represents price per hundred weight for live animals. The valuation figures above are for processed beef.

Source: Production, Price, and Colorado Valuation Data are from Colorado Agricultural Statistics, 1974.

TABLE 19
BEEF AND WOOL IN THE TRI-COUNTY AREA
PERCENTAGE CHANGE IN CASH RECEIPTS,
PRICE AND PRODUCTION

	Beef	Wool
Percentage change in cash receipts, 1970-1973	63.6	126.6
Percentage change in production, 1970-1973	4.6	-8.8
Percentage change in price, 1970-1973	54.2	148.5

* Percentage changes are calculated using 1970 as the base.

SOURCE: Derived from preceding Table.

The production of wool in the region declined over the period 1970-1973 despite the increase in cash receipts. Since 1970, the region's share of sheep shorn in Colorado has declined from 18.3 percent to 16.1 percent. This resulted in the almost 9 percent decline in regional wool production. Over the same period, however, total wool production in Colorado has risen 3.6 percent. The decline in wool production in

TABLE 20
CASH CROPS: VALUATION AND PRICE,
TRI-COUNTY REGION, 1970-1973

	1970	1973	Percent Change *
<i>Valuation (dollars)</i>			
Wheat	1,790,000	5,937,500	321.7
Barley	565,800	864,800	52.8
Corn	32,200	155,800	383.9
Hay	4,215,500	8,869,400	110.4
<i>Price (dollars)</i>			
Wheat	1.17/bu	3.95/bu	237.6
Barley	.96/bu	2.05/bu	113.5
Corn	1.27/bu	2.50/bu	96.9
Hay	25.00/ton	45.00/ton	80.0

* Calculated with 1970 as the base.

SOURCE: Colorado Agricultural Statistics, 1974.

the region represents a response to changing wool prices. Wool was \$.33/lb. in 1970; \$.17/lb. in 1971; \$.38/lb. in 1972; and rose to \$.82/lb. in 1973. (Colorado Department of Agriculture, 1974). The high price received for wool in 1973 probably induced output increases in 1974, although statistics are not yet available.

Livestock and wool contribute the major portion of agricultural production, but production of cash crops in the Tri-County Region is still an important source of income. Census of Agriculture figures indicate that the value of cash crops for the region for 1969 was \$8,348,000, or 19.87 percent of the value of total agricultural products. The census also states that 65.4 percent of this amount was associated with the production of hay. Table 20 presents a breakdown of crop values and prices for the region for 1970 and 1973. Note the decline in the importance of hay's share of total production and the increase in the importance of wheat. For the four crops shown in the table, hay declined from 64 percent to 56 percent of the total from 1970 - 1973 while wheat increased from 27 percent to 37 percent over the same period. The major part of these changes would seem to be related to the change in the relative prices of the two commodities. The price of wheat increased by over 200 percent while the price of hay rose by only 80 percent.

The agricultural sector of the Tri-County Region could be examined in much greater detail, but that is not necessary for the purposes of this report. The intent is simply to determine whether major changes in agricultural employment might occur in the future. There is no evidence since 1970 to indicate that such a major change should be expected. The sector has experienced even more rapidly rising prices than the rest of the economy, but the higher prices have a two-edged effect. Producers of cash crops can expect an increase in income, but those involved in livestock production, the predominant agricultural activity in the study area, face feed costs which have escalated even faster than stock prices. There had been modest production increases through 1973 in cattle and cash crops, but certainly not on a scale large enough to indicate any substantial employment increase. Given continuing basic trends toward consolidation and mechanization, the question of whether there has even been enough growth to stop the employment decline experienced over the 1960's remains open. Based on current information, a "no-change" assumption with respect to agricultural employment seems more clearly warranted than any other.

c. Tourism

The impact of tourism on the Tri-County Region is visible, especially in Routt County, but does not seem to be of great quantitative importance compared to agriculture and mining. Hunting is the most significant tourism activity for all three counties, with skiing important only to Routt County. While it has not been investigated, it seems unlikely, on the basis of available information, that expansion in hunting can support an increase of any magnitude in basic employment.

There may be some increases in basic employment due to skiing, however. These increases in eastern Routt County, which contains the only major ski areas, would only be of peripheral interest. Moffat and Routt have nearly identical population and employment totals, but Routt has higher employment totals in several tourist-serving sectors as shown in Table 21. If the relative excess employment in the four service sectors listed is all attributed to skiing, a total of 106 jobs would have been credited to skiing in 1970. There is no data on how the total may have changed since 1970, but even if it doubled or tripled over the next decade, the impact would not be large compared to the proposed energy-related developments, nor is much of the impact likely to affect the study area.

TABLE 21
EMPLOYMENT IN TOURIST-SERVING SECTORS:
MOFFAT AND ROUTT COUNTIES, 1973

	Moffat	Routt	Difference Routt-Moffat
Eating and Drinking	82	152	70
Hotel and Motel	42	56	14
Other Personal Services	117	132	15
Entertainment and Recreation	31	38	7
Total Employment	2,503	2,527	24
Total Population	6,525	6,592	67

SOURCE: U.S. Department of Commerce, Bureau of Census.

C. INCOME AND EMPLOYMENT MULTIPLIER ESTIMATIONS BASED UPON COLOWYO MINE FIGURES

The ultimate economic impact of location of a new activity within a region depends on a great number of factors particular to both the activity and the region. As in the case of employment, the total economic impact of a project accruing to the region is greater than the income generated directly in the form of salaries and wages and tax revenues. The relationship between direct and total impact can again be summarized by the use of multipliers developed in a similar manner to the employment multipliers described later in this section. In the following sections, the economic multipliers relevant for the macro-site selection process are examined more closely and their approximate magnitude is estimated.

1. THE INCOME MULTIPLIER

The first multiplier that should be estimated is referred to as the income multiplier. Before it can be defined precisely, it is necessary to refer to the definition of types of employment. These definitions are applied below to income rather than employment.

- Direct basic income--income generated by basic economic activity. For example, wages and salaries paid by a mining company or power plant to its employees.
- Indirect basic income--income generated by local firms that sell to the basic activity. For example, a local oil dealer who supplies lubricants for mine machinery will earn additional profits and, if he hires additional truck drivers to supply the mine, he will be paying more wages. These incomes are linked directly to the mining operation and would be called indirect basic income.
- Direct and indirect non-basic income--these effects refer to additional income earned by operators and employees of retailing and service-oriented firms. Miners or power plant employees need to buy groceries, clothes, etc. Providing these goods may require hiring additional clerks or having existing clerks work longer hours, and by this process additional income is induced by the basic income. Non-basic income then is a function of local

- Consumption expenditures which respond, in turn, to the generation of direct and indirect basic income.

The relationships among the various income concepts are represented schematically in Figure 12. Some portion (a_1) of each dollar of direct and indirect basic income becomes local disposable income. The other part of this dollar ($1-a_1$, since the two proportions must sum to 1) goes to taxes and social security payments. If taxes averaged \$.20 on the dollar, then $(1-a_1) = .2$ and $a_1 = .8$, or \$.80 of each dollar of basic income would go on to become part of local disposable income. Part of each dollar increase in local disposable income will be saved and a part is likely to be spent outside of the impact region. The remainder is spent locally for goods and services and is represented by the symbol (a_2). If savings and non-local consumption use is \$.40 of each dollar of disposable income, $a_2 = .6$, which implies that \$.60 of each dollar of local disposable income is spent locally. Looking next at local consumption expenditures, it is apparent that some of these dollars will leave the region since they represent payments for goods purchased locally but not produced locally. The part of each local consumption dollar that remains in the local community represented by the symbol (a_3), goes to local residents as wages, profits, rent, or interest income. Taxes must now be paid on this income ($1-a_1$) and the remainder (a_1) feeds back into the local disposable income box for respending where the coefficient (a_2) is applied to it once again. This circular process continues, with the absolute amount of induced income generated reduced in each successive round because of saving, non-local consumer expenditures, and purchases of non-local materials.

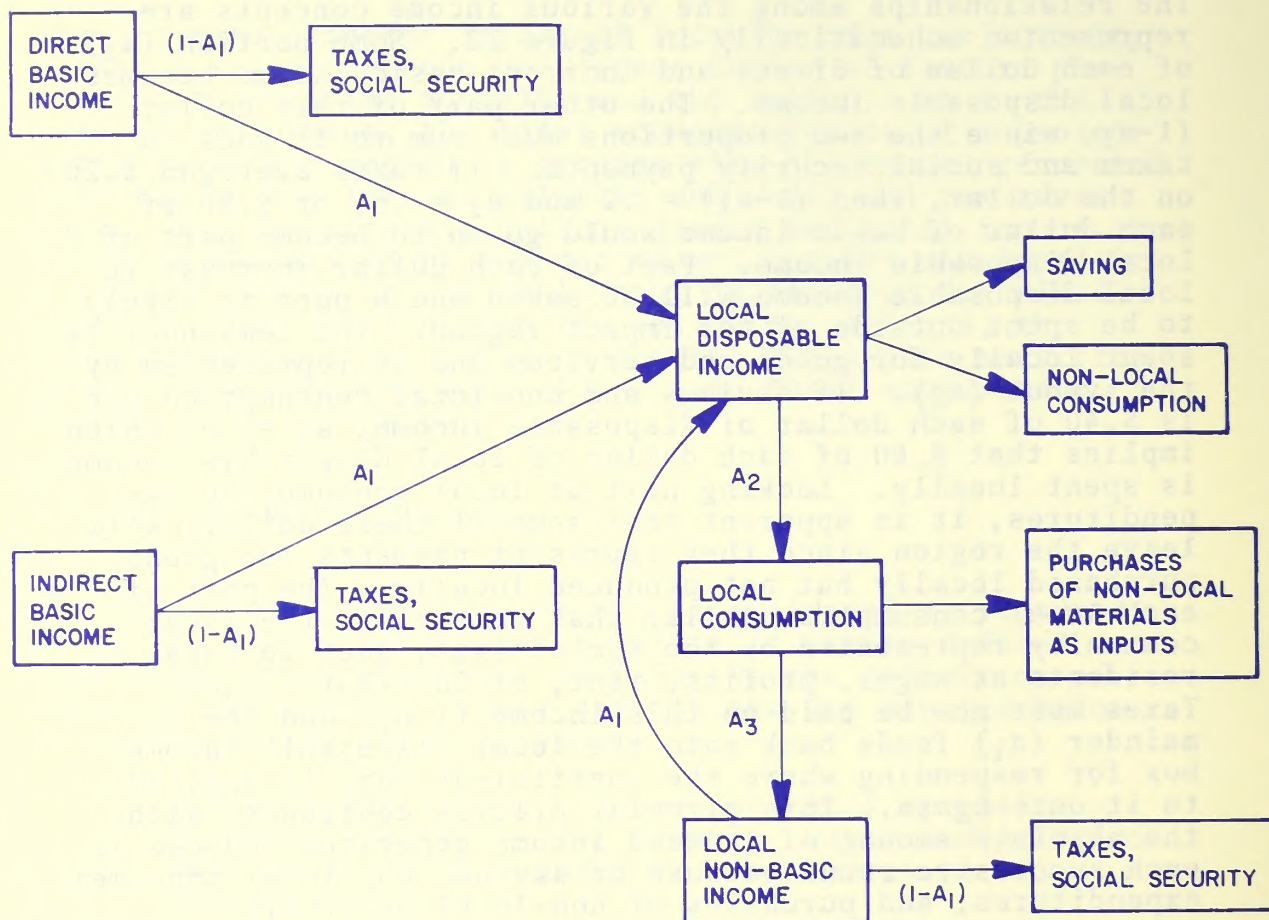
To make the process more clear suppose the following:

$a_1 = .8$ This implies that for every dollar of income .2 of it goes to the government in the form of taxes and .8 goes to disposable income.

$a_2 = .75$ This means that .75 of each dollar of disposable income goes into local consumption. The other \$.25 goes either to saving or non-local consumption.

$a_3 = .33$ This coefficient implies that each dollar spent locally results in \$.33 of local income. The other \$.67 goes to non-local suppliers who provide the goods sold locally.

The effect of an increase in basic income of \$10,000 can now be traced through the diagram in Figure 9. That is,



THE INCOME-CONSUMPTION RELATIONSHIPS

FIGURE 12

SOURCE: VTN



suppose a new employee is hired by a mine and paid \$10,000 per year. What will be the effect on the total income of the region? First, the \$10,000 will be taxed (\$2,000) and only \$8,000 will go on to become part of local disposable income. Of the \$8,000, part is saved and part is spent outside the region, and only .75 of \$8,000 or \$6,000 will be consumed locally. Of the \$6,000, however, two-thirds goes toward the purchase of non-local materials and only one-third or \$2,000 goes on and becomes local income.

But some of this new local income goes on to disposable income (\$1,600) is consumed locally (\$1,200) and once again becomes local income (\$400). Thus, the increase in income so far is \$10,000 + \$2,000 + \$400 + ... If the process were worked through several more rounds, the sum of the series-- i.e., the total income change--would equal \$12,500. In this case, since a basic income of \$10,000 generates total local income of \$12,500, the income multiplier equals 1.25, i.e., $12,500 = 1.25 (10,000)$.

The size of the multiplier depends upon the sizes of a_1 and a_3 . The larger each of these coefficients, the smaller will be the leakages out of the local economy and the larger will be the ultimate increase in local income. The existence of indirect basic income will also increase local income. The magnitude of these variables in the Tri-County Region is estimated below in the context of analyzing the impacts of the Colowyo Mine because especially good information is available on this project.

a. Direct Basic Income

Wage and salary data for the Colowyo mine employees are estimated from data supplied by W. R. Grace & Co. and reflect recent mining union wage increases. The Colowyo Mine project will require approximately 244 employees at full production. Average annual weighted salary per employee will be approximately \$19,000. This yields an estimated total expected direct basic income for these 244 employees of \$386,330 per month.

b. Indirect Basic Income

Indirect basic income was estimated on the basis of primary data gathered for a proposed strip mine of Westmoreland Coal Company located at Sarpy Creek, Montana. The Sarpy Creek and Colowyo operations are very similar except that the Montana mine expects to employ only 71 persons; therefore, the Sarpy Creek estimate of indirect basic income of \$3,416 per month was inflated by a factor equal to:

$$\frac{\text{Colowyo Employment}}{\text{Sarpy Creek Employment}} = \frac{244}{71} = 3.44$$

The estimate of indirect basic income for Colowyo is, therefore, equal to:

$$\$3416 \times 3.42 = \$11,740 \text{ per month}$$

It must be noted that the indirect basic income derived for the Colowyo Mine by utilizing the Sarpy Creek data very likely understates the real Colowyo indirect income effect. The city of Craig is a regional trade center with a greater probability of providing the related goods and services required by a mine than Hardin, Montana, which is a small town without an adequate service sector. (The Old West Regional Commission is considering funding a project to survey establishments in coal-impacted communities so that better information can be obtained on indirect basic effects. When available, this information will be very valuable, but until then, there is no similar data that show how indirect basic effects might vary by size or type of project or by size of nearby communities.)

c. Coefficient Estimation

As indicated in the introduction to this section, the size of the coefficients a_1 , a_2 , and a_3 determines the size of the multiplier. No primary sample³ survey data are available at present for the Tri-County Region, so judgments about appropriate values for the study region were made on the basis of data collected for other similar areas. The results are as follows:

- a_1 : the proportion of total income estimated to become part of disposable income is assumed to equal .76. This implies that .24 of total income is drained off in the form of income payroll taxes. This coefficient is based on interviews of 58 of the 71 employees of Westmoreland Resources at the Sarpy Creek Mine. The average values for each of three subaggregates of Westmoreland's employees were:

Administrative (n = 23)	$a_1 = .76$
Indian Production Worker (n = 20)	$a_1 = .79$
Anglo Production Worker (n = 15)	$a_1 = .75$

- a_2 : the proportion of disposable income consumed locally is estimated to equal .90. This implies that only .10 of disposable income is saved or used for consumption of goods from outside the

region. The survey results at Sarpy Creek gave results for a_2 of .54 for administrative workers, and .64 and .61 for Indian and Anglo production workers, respectively. These estimates are not directly applicable to the situation in the Tri-County Region of Colorado, however, because Craig has a much more diversified and developed retail trade and service center than does Hardin. In 1970, Hardin had a population of only 2,733. In addition, Hardin is only 40 miles from Billings and many of the respondents indicated that they even did their grocery shopping in Billings. The nearest larger trade center to Craig is Grand Junction, but in the absence of evidence to the contrary, it seems unlikely that Grand Junction could attract anything but an occasional shopper given its distance (153 miles) from Craig.

In 1973, about \$.91 was consumed out of an average dollar of disposable income in the United States (U.S. Dept. of Commerce, Bureau of Economic Analysis, 1973). Given the spatial isolation of the Tri-County Region, it seems reasonable to assume that the bulk of the consumption of residents will be local. Due to lack of some consumer items and catalogue sales in the local consumption areas, the national figure was adjusted downward and a_2 was estimated to be .85.

- a_3 : the proportion of local consumption which becomes local income is more difficult to estimate. The estimation procedure is detailed in Table 22 and results in a value of .34.

The estimates of a_1 , a_2 , and a_3 , together with estimates of direct and indirect basic income, make possible the calculation of the total effect on incomes of the Tri-County Region due to the Colowyo Mine. Direct income plus the indirect basic income amounts to \$398,070 per month.

When the product of the a_1 , a_2 , and a_3 coefficients is applied to this sum, the result is \$111,460 of induced income in the first round of expenditures. The feedback mechanism generates an additional \$11,740 of income for a monthly total of \$509,530. The method explained in the example earlier in this section presents the method for calculating the total income change.

TABLE 22
LOCAL INCOME GENERATED BY LOCAL CONSUMPTION

Estimation of a_3 :

Expenditure Category	(1) P_i Local Income Generated per \$1.00 Sales**	(2) Q_i Proportion of Local Expenditures Per Category**
Housing	1.00	.1487
Telephone	.20	.0476
Electricity	.20	.0476
Gas	.20	.0476
Fuel Oil	.20	.0476
Car	.20	.1083
Gasoline and Repairs	.20	.1083
Medical	.90	.0161
Insurance	.15	.0636
Groceries	.15	.2008
Restaurants, Bars, Amusement	.40	.0785
Other	.25	.0785

$$\sum_i P_i * Q_i = .3381 = .34$$

* These are judgmental estimates. They represent an attempt to judge the mark-up over material costs

* These are judgmental estimates. They represent an attempt to judge the mark-up over material costs for the various sectors that provide goods and services to consumer markets.

** *Economic Report of the President*, 1973. Table C-12 Personal Consumption Expenditures, 1929-1972. P. 207.

$$\begin{aligned}
\text{Total income change} &= \$398,070 \left(\frac{1}{1 - a_1 \cdot a_2 \cdot a_3} \right) \\
&= \$398,070 \left(\frac{1}{1 - .2196} \right) \\
&= \$398,070 \left(\frac{1}{.7804} \right) \\
&= \$398,070 (1.28) \\
&= \$509,530
\end{aligned}$$

The multiplier applicable to direct basic income is determined by dividing total monthly income by direct basic income as follows:

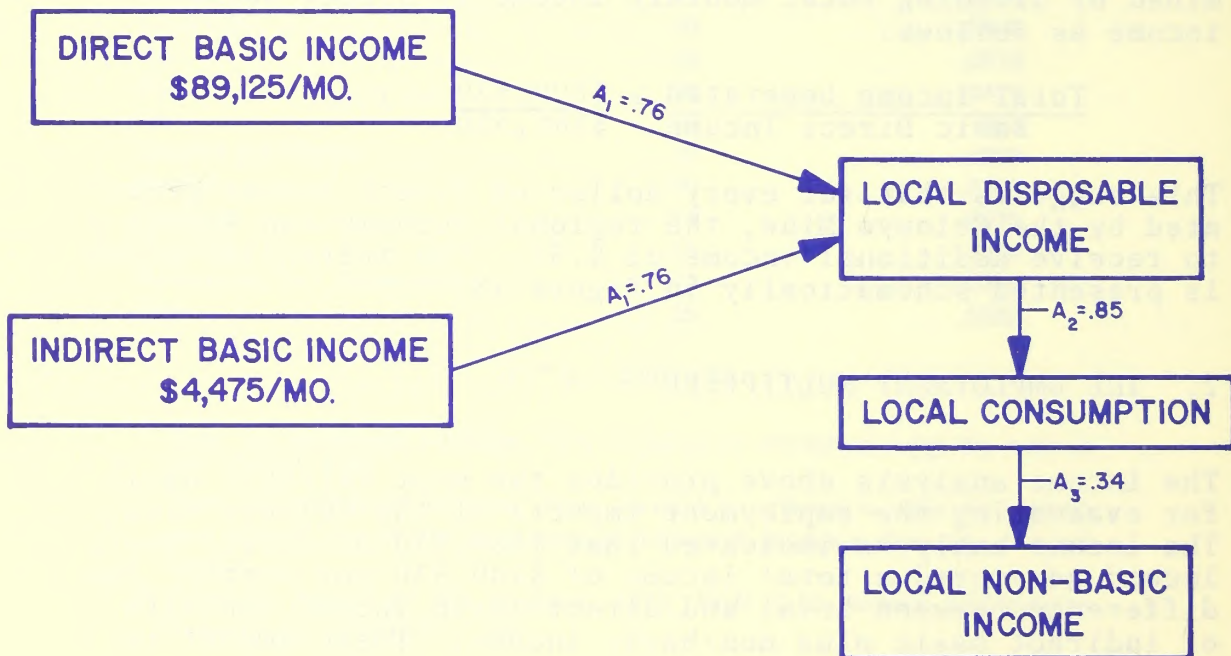
$$\frac{\text{Total Income Generated}}{\text{Basic Direct Income}} = \frac{\$509,530}{\$386,330} = 1.32$$

This suggests that for every dollar of direct income generated by the Colowyo Mine, the regional economy can expect to receive additional income of \$.32. The multiplier model is presented schematically in Figure 13.

2. THE EMPLOYMENT MULTIPLIER

The income analysis above provides the most reliable basis for evaluating the employment impacts of the Colowyo Mine. The income analysis indicated that \$386,330 of direct basic income generated a total income of \$509,530 per month. The difference between total and direct basic income consists of indirect basic plus non-basic income. These amount to \$123,200 per month or \$1,478,000 per year. This sum represents the total annual income that will be generated in the region above and beyond the income paid directly to Colowyo employees.

The next question is how many jobs does \$1,478,000 of income represent. First it must be remembered that what is needed is an average wage across occupations in both the indirect basic sector and in the non-basic sectors of the economy. The mean family income in Moffat County of \$8,297 offers a starting point (U.S. Dept. of Commerce, Bureau of Census). This figure represents a reasonably close approximation of mean earnings per employee. The projection methodology includes an estimation of one wage earner per household, although it is more probable that there will be more than one wage earner per household; at present, this is



difficult to accurately assess. This average wage figure represents 1970 earnings and must be adjusted to reflect 1976 earnings. To inflate 1970 earnings, the 1976 levels were calculated using an average wage index of 9.3 percent per year applied to each year in the six year period; thus yielding an estimated 1976 earnings level of \$12,900. These adjusted earnings were held constant throughout the population projections. This figure (\$12,900) may be somewhat higher if local inflationary impacts are caused by intensive development. The rate of inflation assumed since 1970 is fairly typical of changes in earnings in Colorado in the past five years, as reported in summaries of Colorado business trends in the Colorado Business Review.

It is estimated, therefore, that the additional annual income of \$1,478,000 will generate 114 new jobs (1,478,000 ÷ \$12,900) in the Tri-County Region. These indirect basic and non-basic sector jobs added to the 244 jobs generated by the mine will yield a total employment change of 357 jobs. Hence the employment multiplier can be calculated as:

$$\frac{\text{Change in Total Jobs}}{\text{Change in Direct Basic Jobs}} = \frac{357}{244} = 1.47$$

This employment multiplier represents a legitimate estimate of employment effects if the services sector of the regional economy has no excess capacity disguised as underemployment. On-site analysis of the three counties indicated that there was little, if any, excess capacity and therefore, each new mining job will generate close to 0.5 additional jobs in the region.

3. CUMULATIVE EMPLOYMENT AND RESULTANT POPULATION

In addition to the development of the Colowyo Mine by W.R. Grace & Co., a number of other projects in the Moffat County area and over the Tri-County Region as a whole are already having an effect on the region or will affect the region as they get underway in the near future. These impacts include development of other coal mines, the construction of coal-fired electric power plants, unit train facility construction for delivery of coal to the Craig railhead for shipment east, and anticipated oil shale development in the Meeker area of the Tri-County Region.

Companies proposing energy-related developments within the Study Area were contacted by VTN, and data necessary for forecasting population was obtained. Table 23 gives the estimated or "Best Guess" employment figures by energy development from 1976 to 1995. These forecasts include the possible development of the three oil shale tracts; these are included because of their possible indirect impacts to

TABLE 23

"BEST GUESS" ENERGY RELATED EMPLOYMENT LEVELS

Energy Development	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1990
1. Seneca*	C	0	0	0	0	0	0	0	0	0	0	0	0
	P	65	65	65	65	65	65	65	65	65	65	65	65
2. Energy No. 1	C	0	0	0	0	0	0	0	0	0	0	0	0
	P	140	140	140	140	140	140	140	140	140	140	140	140
3. Energy No. 2	C	0	0	100	0	0	0	0	0	0	0	0	0
	P	3	7	7	107	107	107	107	107	107	107	107	107
4. EDNA	C	0	0	0	0	0	0	0	0	0	0	0	0
	P	60	60	60	60	60	60	60	60	60	60	60	60
5. Wise Hill No. 5	C	0	0	0	0	0	0	0	0	0	0	0	0
	P	25	25	25	25	25	25	25	25	25	25	25	25
6. Apex No. 2	C	0	0	0	0	0	0	0	0	0	0	0	0
	P	4	4	4	4	4	4	4	4	4	4	4	4
7. Craig Mine	C	20	0	0	0	0	0	0	0	0	0	0	0
	P	50	90	140	160	160	160	160	160	160	160	160	160
8. Wise Hill No. 2	C	0	0	0	100	100	0	0	0	0	0	0	0
	P	0	0	0	0	0	100	100	100	100	100	100	100
9. Colowyo	C	100	100	0	0	0	0	0	0	0	0	0	0
	P	124	174	210	244	244	244	244	244	244	244	244	244
10. Railroad	C	100	110	110	0	0	0	0	0	0	0	0	0
	P	0	0	14	29	29	29	29	29	29	29	29	29
11. Meeker Field	C	0	0	0	0	0	30	100	75	25	0	0	0
	P	0	0	0	0	0	0	0	25	50	125	125	125
12. Seneca 2W	C	40	0	0	0	0	0	0	0	0	0	0	0
	P	11	43	43	43	43	43	43	43	43	43	43	43
13. Danforth Hills	C	0	0	0	0	40	100	100	118	157	157	157	157
	P	0	0	0	0	0	0	80	0	0	30	100	0
14. Craig Mine Expansion	C	0	0	0	0	0	0	0	0	0	0	0	0
	P	0	0	0	0	0	0	0	0	0	0	0	0
15. Oil Shale 1**	C	0	33	200	600	600	0	0	0	0	0	0	0
	P	0	0	0	0	400	700	700	700	700	700	700	700
16. Oil Shale 2**	C	0	400	2,000	0	0	0	0	0	0	0	0	0
	P	0	0	100	600	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
17. Oil Shale 3**	C	0	600	2,000	1,400	0	0	0	0	0	0	0	0
	P	0	0	0	600	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
18. Yampa Power Project	C	1,357	1,158	559	0	0	335	1,357	1,158	559	0	0	0
	P	0	36	72	109	109	109	109	109	245	282	282	282
19. Hayden Power Plant	C	0	0	0	0	0	0	0	0	0	0	0	0
	P	77	77	77	77	77	77	77	77	77	77	77	77
20. Moon Lake Power Plant	C	0	0	300	800	800	0	0	0	0	0	0	0
	P	0	0	0	0	100	100	100	100	100	100	100	100
21. Moon Lake Mine	C	0	0	0	0	0	0	0	0	0	0	0	0
	P	0	0	0	200	275	275	275	275	275	275	275	275

* See Tables 25 and 26.

** An estimation of population for Oil Shale Tracts. Not an official statement of personnel needs by developers of the oil shale.

SOURCE: Derived by VTN from personal communication with the various energy-related companies.

the major communities within the Study Area. These data represent information available to VTN as of April 1, 1975; and some figures are extrapolations of hypothetical development based on lease holding information, and indications of development planning by company officials. These are given on Table 23.

The information in Table 23 contains the key to the future of the region. The discussion in the first part of this section concluded that there was no basis to project any significant change in basic employment in the non-energy related sectors of the region's economy. Hence, population and employment change in the study region in the future can be derived by applying the multiplier analysis developed above to the data in Table 23.

Before that step is taken, however, population implications of employment change must be considered. For a unit change in employment in each of the employment categories (construction, permanent basic, permanent non-basic), it is necessary to consider the accompanying change in total population. This amounts to assuming an average family size for construction workers and for permanent employees. (There is no data to support differential family size estimates for permanent basic as opposed to permanent non-basic workers.) The assumptions were as follows:

- Average Household Size for Permanent Employees - 3.5. This estimate of 3.5 includes the employed person and is based on survey data collected in and around Hanna, Wyoming where average household size for permanent mining employees was 3.54 persons. A summary of that survey is included in the appendix to this report.
- Average Household Size for Construction Workers - 2.0. This estimate is taken from that used by the Wyoming Department of Economic Planning and Development in its report titled Coal and Uranium Development of the Powder River Basin, 1974. This figure seems slightly high, but an adequate estimate depends on a number of factors that vary between communities.

The employment multipliers used are 1.47 for production workers based on the analysis of the Colowyo Mine above, and 1.25 for construction workers. This estimate is judgmental. Refinement will have to wait until results from the large scale construction worker survey funded by the Old West Regional Commission are available in the summer of 1975. The construction employment multiplier is considerably lower than that for the permanent production workers. This reflects the fact that many of the construction workers do not bring their families with them.

TABLE 24
SAMPLE CALCULATIONS OF
EMPLOYMENT AND POPULATION IMPACTS

	Employment	Population
Production	500 ¹	1,750 ⁴
Construction	1,000 ¹	2,000 ⁵
Non-Basic Sector	485 ²	1,698 ⁶
Total	1,985 ³	5,448

¹ Given by employer.

² Non-basic employment = production workers x production employment multiplier minus 1 + construction workers x construction employment multiplier minus 1 = $500 \times .47 + 1000 \times .25 = 485$.

³ This can be calculated directly by: Total employment change = production workers x production employment multiplier + construction workers x construction employment multiplier or $500 \times 1.47 + 1000 \times 1.25 = 1985$.

⁴ 1750 = production employment (500) x production population multiplier (3.5).

⁵ 2000 = construction employment (1000) x construction population multiplier (2.0).

⁶ Non-basic employees are treated as permanent employees, i.e., $1698 = 485 \times 3.5$.

SOURCE: Wyoming DEPAD

Hence they do not assert as much demand for local goods and services and, consequently, do not generate non-basic employment to the same extent as do permanent workers.

Table 24 illustrates the calculation of total employment and population changes given a specific change in construction or permanent employment levels. Suppose a projected facility will employ 1,000 construction workers and 500 permanent employees in a given year. The induced employment and population implications are contained in Table 23.

The procedures shown in Table 24 were carried out for eight population forecasts. These are explained in Table 25. These forecasts are a combination of possible developments and reflect the stages of planning and time of operation. For instance, those projects which are in their final stages of planning and are projecting a start-up date prior to 1978 are grouped in Forecast 1. These are also projects which have filed a letter of intent to develop with BLM, and which will be covered in the North West Coal Development Environmental Impact Statement. Forecast 2 reflects those developments which are in the preliminary planning stages and which have a start-up date in the 1980's. Forecast 5 combines all of these projects with the projected oil shale developments, which gives a high population forecast. When population is allocated to communities, this forecast will more realistically show the affects of oil shale within the Study Area. Forecast 8 delineates those projects which are dependent on the development of a rail spur between Axial and Craig. The other forecasts are explained in Table 25.

The estimated population by employment sector is given by forecast and by year in Table 26.

4. PEAKS AND VALLEYS SYNDROME

Figure 14 graphically shows the total estimated population by forecast to 1995. Figure 15 gives the population by sectors for Forecast 3 and 5; total population with and without oil shale development. If development occurs as forecast, which is doubtful, population would rise and decline as employees, in this case construction employees, migrate in and out of the study area. This is known as a "peaks and valleys" syndrome; and when on a large scale, causes "boom and bust" situations to occur.

As stated in the previous section, however, there is a potential for the area to develop far beyond what is known at present. An unknown percentage of the remaining 54

TABLE 25
FORECAST ARRAY FOR PROPOSED PROJECTS
WITHIN THE STUDY AREA

Project No.**	Project and Company	Forecast Number*							
		1	2	3	4	5	6	7	8
1.	Seneca—Peabody Coal								
2.	Energy No. 1—Energy Fuels								
3.	Energy No. 2—Energy Fuels	•		•	•	•			
4.	Edna—Pittsburg & Midway								
5.	Wisehill No. 5—Silengo								
6.	Apex No. 2—Routt Mining								
7.	Craig—Utah International	•		•	•	•			
8.	Wisehill No. 2—Empire	•		•	•	•			
9.	Colowyo—W.R. Grace	•		•		•	•		•
10.	Railroad—W.R. Grace	•		•		•		•	•
11.	Meeker Field		•	•	•	•			•
12.	Seneca 2W		•	•	•	•			
13.	Danforth Hills		•	•	•	•			•
14.	Craig Expansion		•	•	•	•			
15.	Oil Shale 1					•			•
16.	Oil Shale 2					•			
17.	Oil Shale 3					•			
18.	Yampa Plant—Colorado-Ute	•		•	•	•			
19.	Hayden Plant—Colorado-Ute	•		•	•	•			
20.	Moon Lake Electric—Moon Lake	•		•	•	•			

* Forecast Number 1: Those energy related developments which have filed letters of intent with BLM.

Forecast Number 2: Those energy related developments which may occur before 1985.

Forecast Number 3: Combination of Forecast 1 and 2.

Forecast Number 4: Combination of Forecast 1 and 2 excluding Colowyo Mine and Railroad.

Forecast Number 5: All forecast development including oil shale development.

Forecast Number 6: Colowyo Mine development.

Forecast Number 7: Railroad development.

Forecast Number 8: Railroad dependent developments.

** Project Numbers 1, 2, 4, 5 and 6 are existing mines and do not have plans to expand at present.

Project Numbers 3, 7, 8, 9 and 10 are coal mines which have filed letters of intent with BLM.

Project Numbers 18, 19 and 20 are power plants which have filed letters of intent with BLM and which have begun or will begin development requiring increase in personnel.

Project Numbers 11 through 14 are energy companies who are planning a development within the study area before 1985 but which have not filed letters of intent with BLM.

Project Numbers 15 through 17 are oil shale developments which are located outside of the study area but which will impact the study area to some degree.

TABLE 26

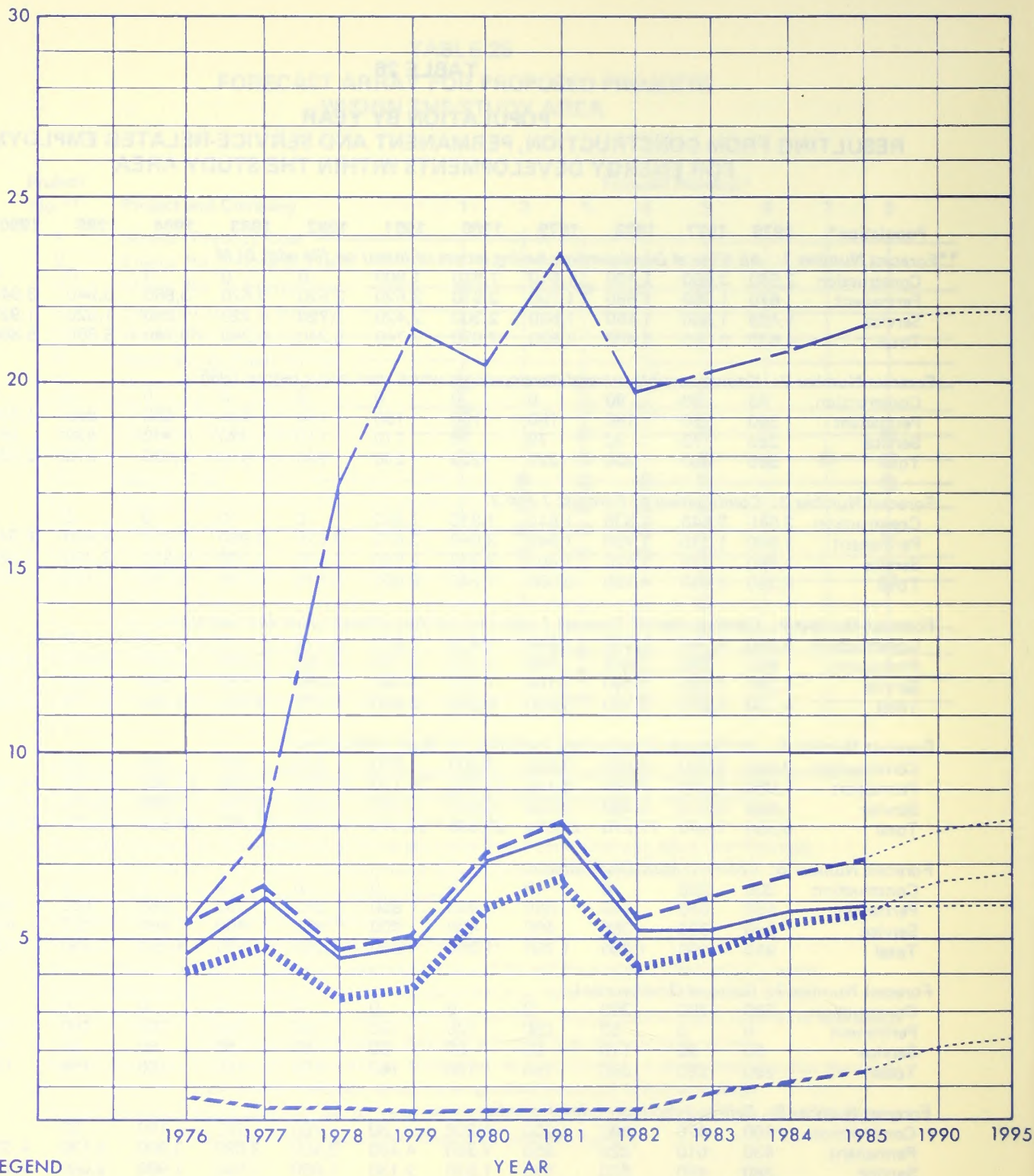
**POPULATION BY YEAR
RESULTING FROM CONSTRUCTION, PERMANENT AND SERVICE-RELATED EMPLOYMENT
FOR ENERGY DEVELOPMENTS WITHIN THE STUDY AREA**

Population*	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1990	1995
**Forecast Number 1: All Mineral Developments having letters of intent on file with BLM												
Construction	2,560	3,460	1,450	1,510	1,810	1,800	0	0	0	0	0	0
Permanent	670	1,090	1,550	1,790	2,910	3,520	3,520	3,520	3,860	3,940	3,940	3,940
Service	1,430	1,500	1,450	1,530	2,300	2,420	1,720	1,720	1,880	1,920	1,920	1,920
Total	4,660	6,050	4,450	4,830	7,020	7,740	5,240	5,240	5,740	5,860	5,860	5,860
Forecast Number 2: Known possible mineral developments which may occur before 1985												
Construction	80	80	80	0	0	0	0	0	0	0	0	0
Permanent	390	150	150	150	150	150	150	430	650	880	1,400	1,490
Service	220	70	70	70	70	110	110	380	370	430	660	700
Total	690	300	300	220	220	260	260	810	1,020	1,310	2,060	2,190
Forecast Number 3: Combination of Forecast 1 and 2												
Construction	2,640	3,540	1,530	1,510	1,810	1,800	0	0	0	0	0	0
Permanent	1,060	1,240	1,700	1,940	3,060	3,670	3,670	3,950	4,510	4,820	5,340	5,430
Service	1,650	1,570	1,520	1,600	2,370	2,530	1,900	2,100	2,250	2,350	2,580	2,620
Total	5,350	6,350	4,750	5,050	7,240	8,000	5,570	6,050	6,760	7,170	7,920	8,050
Forecast Number 4: Combination of Forecast 1 and 2 excluding Colowyo Mine and Railroad												
Construction	2,240	3,140	1,330	1,510	1,810	1,800	0	0	0	0	0	0
Permanent	630	630	910	990	2,110	2,720	2,720	3,000	3,560	3,870	4,390	4,480
Service	1,280	1,100	1,060	1,150	1,920	2,080	1,450	1,650	1,800	1,900	2,130	2,170
Total	4,150	4,870	3,300	3,650	5,840	6,600	4,170	4,650	5,360	5,770	6,520	6,650
Forecast Number 5: All forecast development including Oil Shale development												
Construction	2,650	4,240	9,850	8,800	3,400	1,880	260	400	150	50	0	0
Permanent	1,050	1,230	2,060	6,130	11,450	14,170	13,120	13,400	13,960	14,270	14,790	14,880
Service	1,650	2,470	5,360	6,630	6,840	7,460	6,350	6,540	6,690	6,790	7,020	6,960
Total	5,350	7,940	17,270	21,560	20,690	23,510	19,730	20,340	20,800	21,560	21,810	21,840
Forecast Number 6: Colowyo Mine Development												
Construction	200	200	0	0	0	0	0	0	0	0	0	0
Permanent	430	610	740	850	850	850	850	850	850	850	850	850
Service	280	380	350	400	400	400	400	400	400	400	400	400
Total	910	1,190	1,090	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
Forecast Number 7: Railroad Development												
Construction	200	200	200	0	0	0	0	0	0	0	0	0
Permanent	0	0	50	100	100	100	100	100	100	100	100	100
Service	90	90	110	50	50	50	50	50	50	50	50	50
Total	290	290	360	150	150	150	150	150	150	150	150	150
Forecast Number 8: Railroad dependent developments												
Construction	400	470	600	1,200	1,200	80	260	400	150	50	0	0
Permanent	430	610	820	950	2,350	4,450	3,400	3,680	3,900	4,130	4,390	4,390
Service	380	490	650	970	1,630	2,130	1,800	1,990	1,990	2,050	2,150	2,150
Total	1,210	1,570	2,070	3,120	5,180	6,660	5,460	6,070	6,040	6,230	6,540	6,540

* Population figures were rounded to the nearest 10.

** See Table 25 for list of developments with each forecast.

POPULATION IN THOUSANDS



LEGEND

- FORECAST 1-FILED LETTERS OF INTENT WITH BLM
- - - FORECAST 2-POSSIBLE DEVELOPMENT TO OCCUR AFTER 1980
- . - FORECAST 3-COMBINATION OF FORECAST 1 AND 2
- FORECAST 4-COMBINATION OF FORECAST 1 AND 2
BUT WITHOUT COLOWYO MINE AND RAILROAD
- - - - FORECAST 5-ALL DEVELOPMENT INCLUDING OIL SHALE

NOTE:

FORECAST 6, 7 AND 8 WERE NOT INCLUDED AS THEY ARE NOT REPRESENTATIVE OF TOTAL POPULATION IMPACTS.

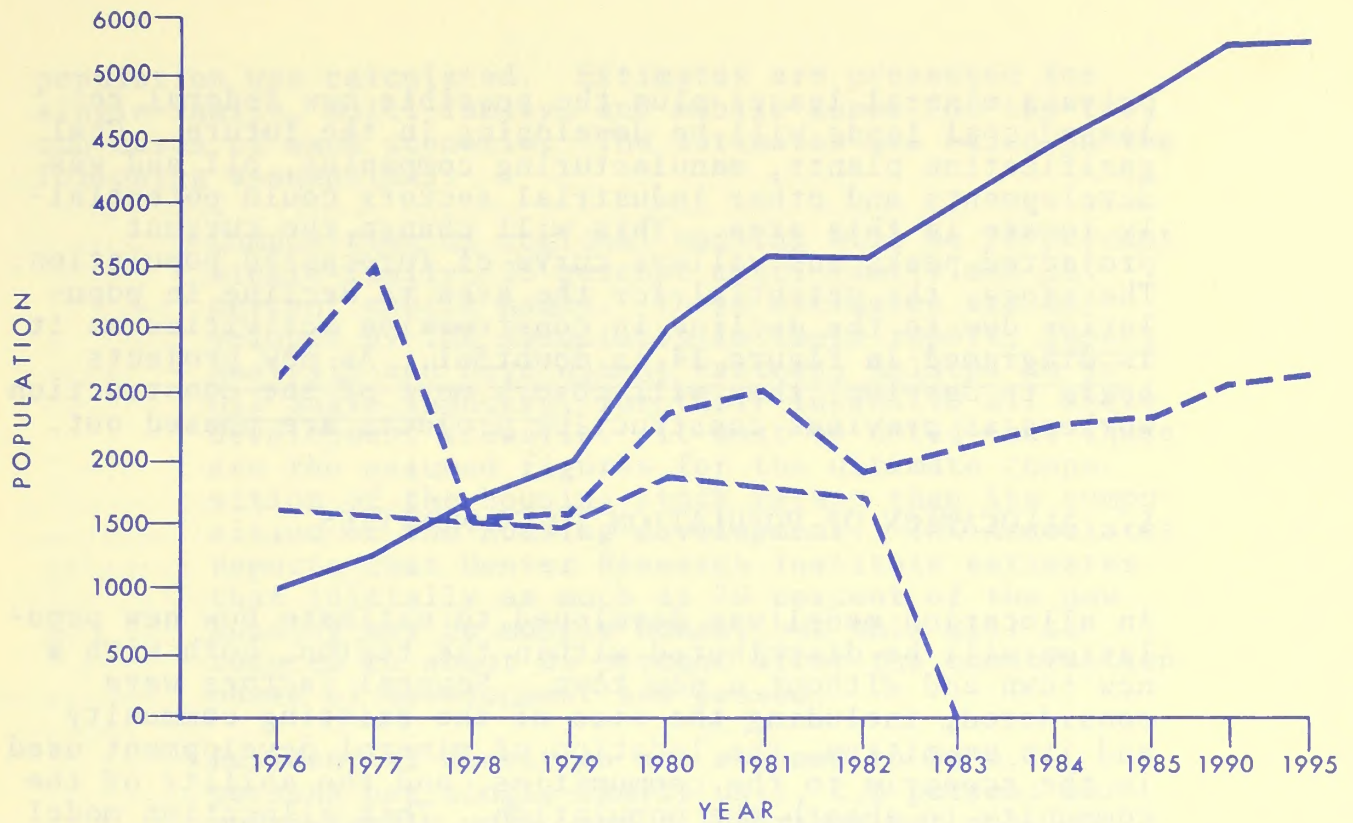


FORECASTED POPULATION FOR
KNOWN MINERAL RELATED PROJECTS

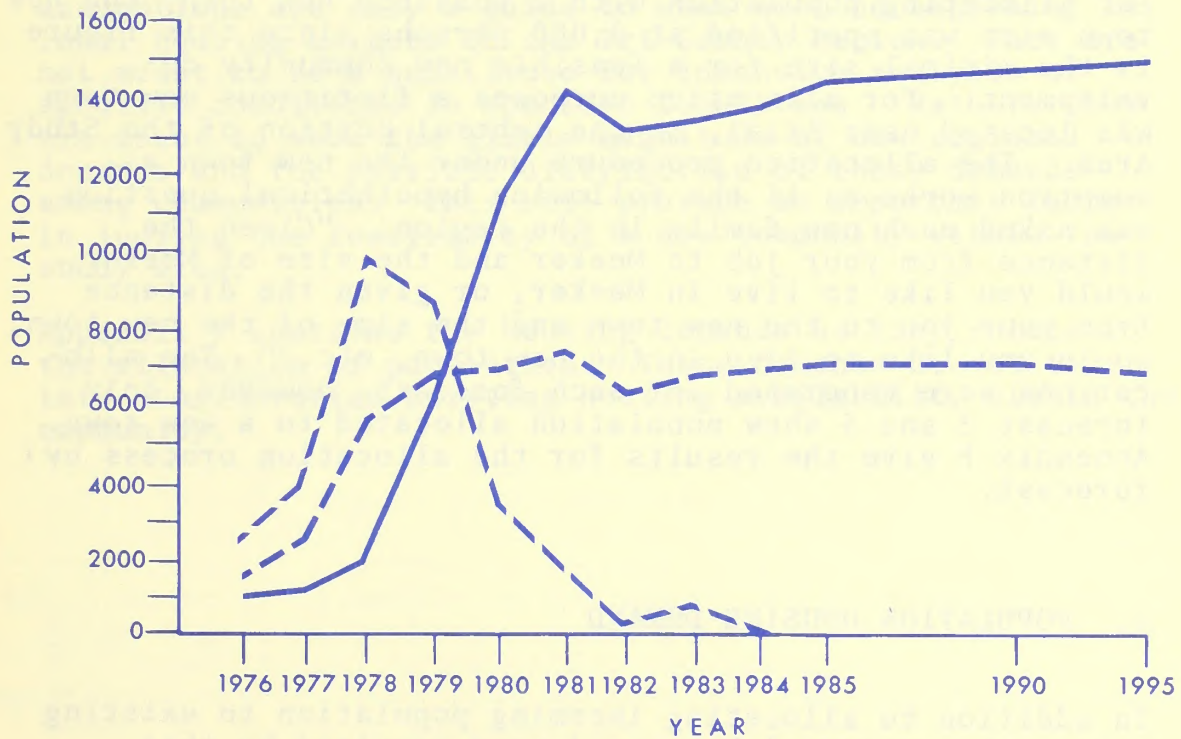
FIGURE 14

SOURCE: VTN

FORECAST 3
ALL ENERGY RELATED DEVELOPMENT EXCLUDING OIL SHALE PROJECTS



FORECAST 5
ALL ENERGY RELATED DEVELOPMENT INCLUDING OIL SHALE PROJECTS



LEGEND — PERMANENT - - - SERVICE . . . CONSTRUCTION

POPULATION BY EMPLOYMENT SECTOR FOR
FORECAST 3 AND FORECAST 5

FIGURE 15

SOURCE: VTN



private mineral leases plus the possible new federal released coal lands will be developing in the future. Coal gasification plants, manufacturing companies, oil and gas developments and other industrial sectors could potentially locate in this area. This will change the current projected peaks and valleys curve of forecasted population. Therefore, the potential for the area to decline in population due to the decline in construction activities as it is diagramed in Figure 14 is doubtful. As new projects begin to develop, they will absorb most of the construction workers as previous construction projects are phased out.

5. ALLOCATION OF POPULATION TO COMMUNITIES

An allocation model was developed to estimate how new population will be distributed within the region, both with a new town and without a new town. Several factors were considered, including the size of the existing community and its amenities, the location of mineral development used in the scenario to the communities, and the ability of the community to absorb the population. This allocation model is not static because the sizes and condition of the communities change over time; therefore, allocations are recalculated each year.

For allocating population with a possible new town, the new town size was specified at 5,000 persons since this figure is the minimal size for a feasible new community development. For allocation purposes a fictitious new town was located near Axial, in the central portion of the Study Area. The allocation procedure under the new town assumption works as if the following hypothetical question was asked each new family in the region: "Given the distance from your job to Meeker and the size of Meeker, would you like to live in Meeker, or given the distance from your job to the new town and the size of the new town, would you like to live in the new town, etc.?" The allocations were generated for each forecast; however, only forecast 3 and 5 show population allocated to a new town. Appendix F give the results for the allocation process by forecast.

6. POPULATION HOUSING DEMAND

In addition to allocating incoming population to existing towns, the potential housing demand required by this

population was calculated. Estimates are presented for single-family, multi-family, and mobile homes for the two sub-cases of each scenario. The estimates are based on the following assumptions:

- Composition of regional housing will be 50 percent single-family, 25 percent multi-family and 25 percent mobile homes. These estimates are developed by THK Associates in their report, Impact Analysis and Development Patterns Related to an Oil Shale Industry, for their intensive oil shale development scenario. It must be noted that these are the assumed figures for the ultimate composition of the housing stock rather than its composition of the housing development. THK Associates reports that Denver Research Institute estimates that initially as much as 70 percent of the new housing may be mobile homes, but this will be reduced to about 25 percent after the construction phase of development has passed.
- Residential densities are assumed to be 3.7 persons per single-family unit, 2.0 persons per multi-family unit, and 2.7 persons per mobile home. These assumptions are also taken from the THK study.

The incremental dwelling unit demands derived under these assumptions are only a guide to what will be happening in local housing markets in the Tri-County Region. They are not meant to be a substitute for intensive analysis of specific conditions in specific localities. Rather, they are meant to show the likely magnitude of new regional demands and the possible distribution of these demands among communities. This will provide an important factor in judging the feasibility of a new community within the study area.

Appendix F contains the housing demands as they relate to the allocation of population. These demands do not take into consideration existing housing availability within the community.

D. HOUSING AND CAPITAL FACILITIES

Housing and capital facilities in Craig, Meeker, and Hayden, which are the communities in the area, have been examined in order to determine how many more people the existing facilities can presently serve, what plans exist for expansion of facilities, the number of people any such expansion would accommodate, and whether there are any special problems associated with expanding the facilities. The capital facilities examined were water, sewer, solid waste disposal, police, fire, school, library, recreation and health facilities.

The capacities and special problems have been examined on a general basis using planning guidelines. Detailed engineering studies will be necessary before making final planning decisions. This section is intended to indicate which towns are presently most capable of absorbing new growth and, on an order of magnitude scale, to estimate how many people these towns can accommodate. The standards used to determine capacities are discussed in detail at the end of the report in Appendix E.

The data on public facilities and housing were analyzed by applying usage standards to existing and planned capacities in order to determine excess capacities and the number of additional people these facilities could serve. Required capacity to serve expected growth of population projections were determined for (1) the existing towns assuming no new community development and (2) the existing towns assuming new community development. This was accomplished by applying usage standards to the population figures projected for each town under the several alternative situations listed in Section II.

1. HOUSING

This section includes a summary of housing demands derived from supportive information given in Appendix E.

a. Craig

As of September, 1974, Craig had an estimated total of 2,324 housing units. This total consisted of 1,153 single units, 395 multi-family units, 603 mobile homes, and 173 non-specified vacant units. Between 1970 and 1974 the percentage

of mobile homes rose from 5.7 percent (104 mobile homes) to 25.9 percent. This increase is due to the rising costs and unavailability of conventional homes.

At present, there are no rental units available, either as apartments or single-family residences. The units for sale do not remain on the market for long despite high prices. Presently, homes which are for sale are ranging between \$20,000 to \$50,000, with an average price of \$30,000 for resale homes. New homes are averaging \$37,500 and are of factory or prefabricated construction.

There are eight proposed developments in and around Craig. These are listed in Appendix E. If all of these are constructed during the next few years, these developments could increase the supply of housing by 2,013 units. Of these, there will be 850 single-family units, 200 multi-family units and 963 mobile home sites. Of the 963 mobile home sites, 400 are being designed so that they may later be converted to single-family homes.

At present, there is a limited construction labor force; however, as development begins, necessary manpower will be attracted from other areas, most notably from Denver and Steamboat Springs.

b. Meeker

As of September, 1974, there were an estimated 739 dwelling units which consisted of 580 single-family units, 60 multi-family units, 29 mobile homes and 70 unspecified vacant units.

There is no housing available in Meeker at present, and no units have been rented or sold since the spring of 1974. Housing is limited to individual customer construction on an individual by-lot basis.

Residential land values within the city limits vary from \$6,500 to \$7,500 for partially improved lots lacking utilities to approximately \$7000 to \$8000 for fully improved lots. Housing resale prices have ranged from \$30,000 to \$45,000 while the six custom homes now being built range from \$27,000 to \$42,000. Rents range from \$150 to \$350 per month, while trailer pad rentals average from \$60 to \$70 per month.

There are three housing proposals which would more than double the supply of housing. The proposals are for a 12-unit apartment complex; a subdivision with 132 single-family homes, 46 units in duplexes and triplexes and 332 trailer

homes; and a mobile home court with 400 spaces. Together these developments would supply 924 new units. It should be noted that these developments are still in the proposal stage.

Present housing construction is primarily frame and pre-fabricated and factory housing. In Meeker, as elsewhere, the shortage of qualified labor, an increasing demand for housing, and high construction costs will probably result in a trend towards more factory housing and mobile homes.

c. Hayden

As of September, 1974, Hayden had a total of 503 dwelling units. This total consisted of 350 single-family units, 23 multi-family units and 130 mobile homes. At that time, there were no homes for sale or rent, and the trailer parks were nearing capacity. Prices ranged from \$24,000 to \$30,000 for used housing and from \$25,000 to \$30,000 for new homes. The rentals varied from \$140 to \$200 per month for conventional units. Trailer units rented from \$125 to \$225 per month and trailer pads rented for \$60 to \$70 per month. Land prices were somewhat lower than in Craig and Meeker, ranging from \$6,000 to \$7,000 for improved lots to approximately \$2,000 for unimproved lots. Most units are factory and modular housing.

One 22-unit single-family home development is presently under construction and two other new subdivisions have been proposed. If realized, these proposals could provide a total of 684 to 789 new units, doubling the present housing supply. One 43-acre subdivision proposal will have 72 single-family units and 200 apartments. This development should be ready for occupancy by the end of 1974.

The third proposal is for a 92-acre subdivision which will have 10 to 15 single-family homes, 80 units in duplexes and 300 to 400 apartment units. This development has yet to acquire sewer and water connections and therefore will be completed later than the other two developments. It should be noted that there are no proposed mobile home developments. A proposal for a 320-unit mobile home court was rejected by the city. The building inspector felt that it might have been approved had it been better planned, but that in general the city was opposed to mobile home developments.

Construction labor supply is better in Hayden than in Meeker and Craig due to a slump in construction work in nearby Steamboat Springs. An additional labor supply is furnished

by Hayden power plant construction workers for whom housing construction provides a secondary source of employment income.

2. CAPITAL FACILITIES

Capital facilities in Craig, Meeker, and Hayden have been examined in order to determine how many more people the facilities can presently handle, what plans there are for expansion of facilities, the number of people any such expansion would accommodate, and whether there are any special problems associated with expanding the facilities.

The facilities examined for each city are water, sewer, solid waste disposal, police, fire, school, library, recreation and health facilities.

a. Craig

Water Supply and Facilities

Currently Craig had adjudicated water rights dating from 1915 to 9.25 acre feet a day (afd) and another 6.5 afd of conditional rights to water from the Yampa River. The conditional rights will become absolute rights when the city begins to use the additional water. In case of emergency needs, the city has an agreement with Colorado-Ute Electric Association to use up to 9.9 afd of the company water rights from the Elk Head Reservoir. Based on usage standards of 0.2 acre feet per person per year, the city's water rights are sufficient for a population of 28,000 people or approximately 22,000 more than are currently served. The 9.9 afd reserve from the Elk Head Reservoir may be used to meet occasional peak daily needs.

The treatment plant has a capacity of 5 million gallons per day (gpd). Current usage averages 1,552,000 gpd although peak useage has reached 3 million gpd. This is equal to an average daily use of 250 gallons per person and a peak use of 500 gpd per person. These figures are higher than state estimates of 180 gpd per capita average use and 450 gpd per capita peak use which are recommended for planning. To estimate the capacity of Craig's water treatment plant, therefore, Craig's actual usage figures will be used.

With a peak usage of 500 gpd per capita, the plant can supply enough treated water to serve a population of 10,000 people, or 4,000 more persons than it serves now.

The water distribution system is currently at capacity. Throughout the downtown area, the distribution system consists primarily of 4-inch pipe. These pipes are replaced with 10-inch pipe whenever they require repair or for any other reason are uncovered. The larger pipes are needed to increase the flow and pressure throughout the system. When the smaller pipes downtown are replaced, the pressure and capacity of the system will be adequate to service extensions to new areas. The major constraint then will be treatment capacity.

Sewer Facilities

The sewer treatment facility in Craig is a lagoon system consisting of three cells provided with aeration equipment and having a total surface area of 29.5 acres. The system presently treats about one million gallons a day, which is over capacity for adequate treatment. The quality of the treated sewage, therefore, is below standard, especially on peak usage days.

Plans have been made for new equipment which would increase the system's capacity to serve a population of 15,000 adequately. If this is done, the system could be expanded to serve another 9,000 people. No funds have been allocated for this purpose, however.

The sewage collection system is also at capacity. The city plans to replace some of the smaller mains and has ordered pipe for this job. The state funds with which the city expects to pay for the pipe have not yet been received, however. If these pipes are replaced, the collection system will be able to handle increased growth by line extensions to service the new area.

Solid Waste Disposal

The current 40-acre sanitary landfill site is almost full and the city is leasing another 40-acre site. Based on the assumptions delineated in the section on standards, a town of 6,000 (Craig's current size) would utilize approximately 1.5 acres a year and the new site would not be filled until the year 2000. Increased population would accelerate this

usage by 0.25 acres per year for each 1,000 population increment; therefore, it would take a population of 32,000 to fill this site within five years. Even if the waste is not compacted as well, as is assumed in the standards, solid waste disposal is not likely to be an urgent problem.

Police

Moffat County and Craig have a joint police department. The staff is headed by the sheriff and consists of eight patrolmen stationed in Craig, one stationed in Dinosaur, three jailers and one matron. The department would like to have two men per thousand in Craig and is currently three men short of meeting this standard. It also has only two cars and two more are needed. Police facilities are currently over capacity and there are no definite plans for expansion.

Fire

Craig's 20-man volunteer fire department has an insurance rating of eight, which is normal for a town of its size. The department's equipment consists of two four-wheel drive trucks, a 1,200 gallon tank truck, and two engine trucks, one having a 1,000 gpm pumping capacity and the other a 750 gpm pumping capacity.

The present fire flow capacity is 1,750 gpm and most small towns require 2,000 to 2,500 gpm. If rapid growth results in apartment construction and trailer courts, it is likely that the town will need at least 2,000 to 2,500 gpm flow.

Schools

The school administration in Moffat County described the schools as adequate for present needs. In Craig there are three elementary schools, a junior high, and a senior high. The elementary schools have a total capacity of 870 students and an enrollment of 734, leaving an excess capacity for 136 students. However, Breeze Elementary, with a capacity of 250, is in poor condition and should be replaced. The junior high school has a capacity of 550 with an enrollment of 443, leaving an excess capacity of 107. The high school has a capacity of 540 and an enrollment of 534, leaving an excess capacity for six students.

*it is not
7 or 8
is a
reasonable
rating*

Plans have been completed, but are not yet funded, for enlarging the school facilities in Craig based on Colorado-Ute population projections. Construction would be started in 1975 and continue in stages through 1982. Plans have been made for a maximum capacity increase of 387 elementary students, 204 junior high students, and 497 high school students; however, the projections indicate that maximum capacity needs will occur in 1977 and fall to a level of 343 additional elementary students, 65 additional junior high students, and 345 additional high school students by 1982. If these population projections remain valid, the school board will probably build to meet the needs of 1982 and use portable units to handle the temporary needs in 1977.

Throughout the rest of the county there are five rural elementary schools. Three of these, Hamilton, Browns Park, and Powder Wash are one-room schools and could handle five to ten more students each. There is a three-room school in Maybell and a six-room school at Dinosaur, both of which are close to capacity. If necessary, students from Dinosaur may be bused to Rangely in Rio Blanco County (Moffat County would pay tuition for the students) but schools there are also being impacted by growth due to oil shale development and are not likely to have excess capacity.

Library

The public library in Craig serves Moffat County and has a small branch in Maybell. It has 27,000 volumes and approximately 3,900 square feet of usable space in the library building.

This system can adequately serve a larger population. According to national library standards, the present number of volumes is adequate for a population of 13,500 and the library's size is adequate for a population of 10,000.

The library staff would like to increase the size of the building by 7,400 square feet and preliminary plans have been prepared but not yet approved.

Recreation

In the immediate vicinity of Craig there are city, school and privately-owned recreation facilities.

The city has a four-acre park with playgrounds, game fields, camping and picnicking sites, a swimming pool, and three regulation tennis courts. The school board has a total of 24 acres in open space, playgrounds, and sports fields. Although not public facilities, the private recreation facilities help meet the recreation demands of the population. Private facilities in Craig include five acres of trailer camping and picnicking facilities, 515 acres with trap and target shooting sites, and a privately-owned pool. There is a 20-acre 9-hole golf course in the area. The county fairgrounds also are located in Craig.

Even though the facilities are varied and more is offered than in many other towns in the area, the facilities are inadequate for the size of the present population. This may be partially offset, however, by the varied outdoor recreation facilities in the region.

Hospital Facilities

Craig has a 34-bed hospital which serves an estimated 8,500 people. Based on the current use rate of 0.705, the hospital can serve a population of 14,084 people. The excess capacity would handle a population increase of about 5,584 people in the hospital's service area which extends from Maybell east to Milner and from Axial north to Baggs, Wyoming. A new 60-bed hospital which is in the planning stages will, when completed, replace the existing facility. At the current use rate, the proposed facilities could serve a total population of 24,851. If funds cannot be made available for a hospital of this size, a smaller one will be considered along with improved transportation, such as helicopter service, to major hospitals in the area.

Doctors

The hospital currently has four doctors. The hospital is acquiring another doctor, and possibly two, in the fall of 1974. Using recommended standards of one doctor per thousand, this number of doctors is adequate for 5,000 to 6,000 people; therefore, even with the additional doctor(s) there may be too few doctors to adequately serve the existing population.

b. Meeker

Water Supply and Facilities

Meeker has adjudicated water rights to 6.78 (afd) from the White River. These rights date from 1920 and may be considered a firm and dependable source. The town has rights to another 13.88 afd from the White River which were adjudicated in 1958. These are junior rights and may be subject to shortages, because earlier claims have first right to the water. The 6.78 afd will support a population of 12,738 people or 10,738 more than the present population. The 13.88 afd will support another 25,331 people but are a less dependable supply.

The water treatment plant can produce 750,000 gpd of treated water. Although water flow readings at the plant indicate high usage (due primarily to overflow at the plant and "bleeding" of home taps during the winter to prevent freezing), actual domestic use averages 100 gpd per capita, and peak use is close to 450 gpd. Using state design standards of 450 gpd per capita, the plant can service 1,449 people which indicates that it is now slightly over capacity. The Wright-McLaughlin water study for Meeker, prepared in 1974, contains plans for expansion of the plant. These plans have not yet been approved. Under alternatives I and II of the Wright-McLaughlin plan, Phase I would supply an additional capacity of 20 million gpd which would serve 3,900 people, and Phase II would bring the total supply to 3.5 million gpd which would serve a total population of 6,800. The existing plant would be phased out. If Phase I were completed, Meeker could handle an additional 1,900 people and with Phase II completed, Meeker could service a total population increase of 4,800. Alternative III would supply the same amount of water, but the source of supply would be underground wells. Due to the natural filtering of the soil, a treatment plant would not be required.

The water distribution lines are at capacity. To expand the system will require replacement of existing lines as well as the extension of lines to service new areas.

Sewer Facilities

The sewage treatment plant has a capacity of 200,000 gpd, and it is presently over capacity. Average daily usage is 275,000 gpd while peak use is 325,000 gpd. This is equal to

an average use of 137 gpd per capita and a peak use of 163 gpd per capita. Plans prepared by Merrick & Co., Engineers and Architects, have been made for expansion of the treatment plant. Phase I of the plan, which will increase the capacity of the plant by 200,000 gpd, is to begin in the summer of 1975. Later, Phase II will bring the plant to a total treatment capacity of 1,200,000 gpd. A bond issue will need to be approved in the fall of 1974 in order for funds to be available for the project. Using state design standards of 168 gpd per capita peak usage, which is close to the town's present peak usage of 163 gpd per capita, the plant will be able to serve 2,380 people with Phase I completed. With Phase II completed, the plant could serve 7,143 people. The ability to serve an additional 380 people will be achieved with Phase I, and an additional 5,143 people would be accommodated with the Phase II expansion.

The sewage collection system is at capacity. Any increase in population would require additional lines and possible replacement of some of the feeder lines.

Solid Waste Disposal

Meeker has between five and eight acres of land left at its sanitary landfill site and expects it to last for another five years with the current population. If new sites can be acquired before the present landfill is filled, there will be no problem. If Meeker's population grows by more than a few families, either the mines could agree to lease land to the counties for this purpose or better methods of compaction will have to be employed at the sites in order to use the land more efficiently. The latter method will require additional equipment and personnel. Presently the town has one bulldozer which is in poor condition to move, compact, and cover the filled areas.

Police

The police department staff consists of the chiefs and two patrolmen, and the department would like to hire another patrolman. The department has two squad cars. Office space is inadequate but there are plans to expand City Hall, which will provide more space for the department. Presently, the department's facilities are slightly over capacity. If another patrolman is acquired, they will be at capacity. Any population increase will require additional manpower and facilities.

Fire

The 30-man volunteer fire department's equipment consists of an emergency vehicle, an equipment truck, and two engine trucks each with a pumping volume of 500 gpm. The department is also getting a new truck with emergency equipment.

The department's total pumping capacity is 1,000 gpm. Most small towns require about 2,000 to 2,500 gpm. Meeker is compact, low level, with no industries and few apartments and, therefore, may not require 2,000 gpm flow. Their fire insurance rating is eight, which is average for small towns. New growth, however, especially apartments and trailer courts, will probably increase the need for fire protection, requiring additional engine trucks, a larger fire station, and more men.

Schools

Presently, the schools in Meeker have a slight excess capacity. There is one elementary school which has a capacity of 400 and is now serving 320 students, leaving room for 80 more students. A new junior high school is needed, and if it is built, the present junior high school may be converted to elementary classes. This would increase the elementary school capacity by 150. The present elementary school site is in the downtown area and cannot be expanded. In the future, the school district wants to replace this school, but no plans have been made. There is one rural two-room elementary school located at Piceance Creek, which has minimal excess capacity.

The junior high has the capacity for 150 students and a present enrollment of 130, leaving an excess capacity which would facilitate 20 more students. There are plans for a new junior high with a capacity of 400, but this still has to be approved by the city government. If funds can be acquired, the school district would like to construct the school in 1975 or 1976. If funds are a problem, the district may have to reduce the planned capacity of the school to 200 and try for approval of a smaller school. If this school is built and the present junior high is converted to an elementary school, there will be an excess capacity for 70 to 270 more students, depending on the completed size of the school.

The high school is new and has a capacity of 300 with an enrollment of 230 students. Presently, the school could take an additional 70 students. It has been designed so that the

present building can be expanded to accommodate 400 more students; therefore, the school's excess capacity could be extended to 470.

Library

The library in Meeker serves the eastern part of the county. It is new and spacious with 4,500 square feet and 9,000 volumes. According to national library standards, while the number of volumes is sufficient for a population increase of 500, the space is adequate for a population increase of 7,500.

Recreation

Meeker has better recreation facilities than most small towns in the area. The city has a five-acre park with playgrounds, camping, fishing, picnicking and a pool. The school board has a total of 16.5 acres of recreation land in Meeker with sport fields, playgrounds, and two regulation tennis courts. A privately owned five-acre trap and target shooting area with two sites; a 20-acre 9-hole golf course which is scheduled for expansion, and a 24-acre outdoor recreation area with camping, picnicking, boating and fishing also are located in the Meeker area.

Public open space in neighborhood and district parks, include the privately-owned golf course, is adequate for a population of 2,400. The physical recreation facilities in town would handle a population increase of 1,000 to 2,000 before becoming overloaded. Regional recreation facilities, while adding to the variety of facilities, are adequate for a population of 3,300, only about 300 people more than the current regional population.

Hospital Facilities

Meeker has a 20-bed hospital. In 1973, the hospital had 2546 in-patient days. Based on a current service population of 3,000, the hospital's current use rate is .84. Therefore, the hospital's size is sufficient for a population of 6,881, or a 3,881 population increase. The hospital has two doctors, based on recommended standards, the area would now need one more doctor.

c. Hayden

Water Supply Facilities

Hayden has adjudicated rights to two acre feet per day (afd) and conditional rights to another two afd from the Yampa River. Based on needs of 0.2 acre feet per day per capita, Hayden's water rights are sufficient to serve a population of 7,300, or a population increase of 5,800 people.

The capacity of the water treatment plant is 500,000 gallons per day (gpd). Average use is 175,000 gpd in the winter and 300,000 gpd in the summer. Peak use is 425,000 gpd. Based on current usage patterns, the capacity of the plant is sufficient to serve 1,700 people, and is therefore nearly at capacity. The city engineer would like to get a new filter system and additional storage tanks. If this were accomplished, he feels the plant's capacity could be increased to 1,152,000 gpd which would serve about 1,800 more people.

The water distribution system is over capacity. Currently, the town is replacing several 4-inch mains with 8-inch mains to form a loop around part of the town. This should be continued around the rest of the town but additional funds would be needed. If the loop is completed, the system capacity would be sufficient to accommodate the extension of lines to service new areas.

Sewer Facilities

A lagoon system is used to handle sewage treatment and comprises a four-acre cell and a three-acre cell with aeration equipment. The effluent is discharged into the river. The system is now treating approximately 650,000 gpd and is over capacity. There is a major problem with infiltration in the collection system which is overloading the lagoons and reducing their effectiveness. If the defective lines are replaced, the sewer treatment facilities could handle a population increase of approximately 500 people.

Solid Waste Disposal

The sanitary landfill in Hayden has been closed and one in Milner reopened. This landfill serves approximately half the county including the towns of Hayden, Steamboat Springs,

and Milner. The site is expected to last about another year with the present population which varies from about 6,000 to 12,000 depending on the season. The county is rapidly running out of land for solid waste disposal and it is difficult to acquire new sites since no one wants to be located near a landfill. The situation in Hayden is similar to the one in Meeker, although more acute. Any additional population will almost immediately necessitate an additional site which may be difficult to acquire unless the mines agree to make land available for this purpose.

Police

The police department staff consists of the chief and a patrolman. The department has two fairly new cars, an office at City Hall, and the use of the county jail located in Steamboat Springs. The police also patrol the airport and are presently over-burdened, with a least one more staff member needed. Any population increase requires additional policemen and possibly another car. The office space will probably be sufficient for a staff serving 2,000 to 2,500 people. It is also felt by the department that a jail should be built in Hayden since transporting prisoners to Steamboat Springs places an excessive burden on the patrolman's time.

Fire

The 25-man volunteer fire department has three trucks equipped with pumpers: a 500 gpm engine truck, a Dodge 4 x 4 300 gpm truck, and a Forest Service 250 gpm truck. The department also has a tank truck which holds 1,850 gallons. Until this year, the department had an insurance rating of eight which is standard for a town of its size. This year the rating changed to nine because of the outdated engine truck. The department is requesting a 1,200 gpm truck and expects to have it by next year, although the request has not yet been funded. If this truck is acquired, the department will have a total pumping capacity of 1,750 gpm and possibly 2,250 gpm, if the older truck can still be used. Unless substantial construction of apartments or trailer courts occurs, this will probably be adequate to handle a population growth of up to 8,000. There are plans to enlarge the station for the new truck, but they have not yet been approved.

The number of volunteer men may also need to be increased. Twenty-five is the minimum number of men needed to handle the

equipment. Volunteer departments generally have a few more men than a regular fire department.

At times in the past the flows from the water pipes have been inadequate although pressures are adequate. The current replacement of pipes in the water system should correct this problem.

Schools

The school district extending from the county line east to Milner has one school located in Hayden. The school is divided into grades K-6 and grades 7-12.

The elementary section has a capacity of about 250 and a current enrollment of 228 students. The school could absorb about 50 more children but, in order to do so, would have to convert special rooms, such as the library and music rooms, to classrooms. The high school is in a similar situation. The school has an enrollment of 210 and could handle 25 to 50 more students. The school is nearly at capacity and there is no room for expansion on the site.

The school board has been considering building a new school to be used either as an elementary school or high school, but no firm plans have been made. If the schools have to be expanded, hiring more teachers may be a problem since a teacher's salary does not adequately cover the high costs of living in a high growth area. Trailer rentals, for instance, are as high as \$225 a month here.

Library

The Hayden Public Library has 4,800 volumes and approximately 1,250 square feet of space. These facilities do not meet national minimum recommended standards for populations of 2,500 or less.

Recreation

Recreation facilities are inadequate. There is one small park with a baseball diamond, a museum, a youth center, and a cycle track. Facilities not only do not have any excess capacity, they are insufficient for the present population.

Health

There is a Public Health Service Clinic and a Mental Health Clinic in Hayden, but the hospital has been closed, and there are no doctors or dentists. Two nurses from Steamboat Springs regularly visit the Hayden area, and there is a nurse at the school. The town expects to get a dentist in October. Most people go to Craig for medical services. Craig is only a 15-minute drive away, and therefore services in Hayden itself are adequate and may not need to be expanded to meet the needs of increased population. There is an ambulance in Hayden on loan from the County. It is operated by eight volunteers who have received ambulance medical training.

3. POPULATION GROWTH WHICH CAN BE ACCOMMODATED BY PRESENT AND PLANNED FACILITIES

a. Craig

The housing in Craig is fully occupied and prices are high (relative to historic price levels) for both new and used housing. The proposals for new housing could provide an additional 2,013 units which would nearly double the present supply. Based on an average household size of 3.33, this number of units would support a population increase of 6,703.

Craig is in a relatively good position regarding public services (in terms of available services and excess capacity) when compared with other towns within the region which may face significant population increases as a result of energy development.

The water supply is adequate to handle 22,000 more people; the treatment plant, 4,000 more; and the distribution system is being repaired so that future needs can be met by merely extending lines to new areas. Although the sewer treatment plant is at capacity, it is being improved, and when the work is completed, it will be capable of serving a 9,000 population increase. The landfill will be sufficient for several years. Even if the population were to increase by 25,000, the present site would be adequate for five more years. The library can serve a population increase of 4,000 before becoming overcrowded. The hospital facilities can serve another 5,600 people if the town acquires more doctors.

School facilities are at capacity, and recreation and police facilities are presently over capacity. The fire department

will probably require expansion if there is any growth, particularly if the growth takes the form of apartment construction and trailer courts.

With the addition of one or two schools and by increasing the police department's capabilities, the town's facilities could accommodate an additional 4,000 people. This may allow enough lead time for expanding other facilities to meet additional population increases, depending on the rate of population growth.

b. Meeker

There are no housing vacancies presently in Meeker. Proposed developments could provide another 924 units which would more than double the present supply. The new units could accommodate a population increase of 3,077 based on an average household size of 3.33.

Meeker's facilities are adequate to meet the needs of its present population, but have very little excess capacity.

The schools can accommodate a population increase of about 500 people. The hospital facilities can absorb an increase of 3,881 people if more doctors are acquired. Recreation facilities can also accommodate a population growth of about 500.

Other facilities are presently slightly over capacity, including water and sewer which are the most critical services. The library building can serve another 7,500 people, but the number of volumes must be increased in order to serve any additional population.

In anticipation of population growth, the town has contracted engineering studies for the expansion of water and sewer facilities, and the school board has prepared plans for expansion. None of the work has yet been funded, however.

The plans for the water treatment plant call for an expansion which would serve an additional 1,900 people at completion of Phase I and another 3,900 at the completion of Phase II, for a total increase capable of serving 5,800 more people. The sewer treatment plant would be able to serve 380 more people at the end of Phase I and another 4,763 at the end of Phase II, for a total development capable of serving 5,143 more people.

The new high school was designed so that it could be expanded to serve an additional 400 students. If this were done and the new junior high built, the school system could serve a population increase of about another 2,000 people.

Presently, the town is not equipped to absorb additional populations adequately. If the water, sewer and school plans are funded and implemented, the town will have the capacity to absorb a population growth of 2,000 to 4,000 unless police, fire, recreation and library facilities are also expanded.

c. Hayden

There is no housing available for sale or rent in Hayden. Proposed developments could provide 684 to 789 more units which again would more than double the present supply. The new units, if constructed, would be able to house a population increase of 2,275 to 2,625.

Hayden's facilities do not have excess capacities. Although no plans have been made to expand the water treatment plant, the replacement of the filter system and acquisition of additional storage would enable the plant to serve 1,800 more people. The sewer treatment plant will be able to handle another 500 people when the defective collection pipes are replaced.

The schools could handle about 50 more elementary students and 25 to 50 more junior and senior high students if special rooms such as music, library, etc. were converted to classrooms. These alterations would allow the schools to serve an approximate population increase of 300 people. The school board has discussed building either a new elementary or middle school, but no plans have been made. Even if population in Hayden does not increase, population growth near Craig could impact the schools in Hayden if the growth extends across the county line and, therefore, must be considered in planning.

The police, fire, solid waste disposal and recreation facilities would also need to be expanded in order to absorb any population increase.

Hayden's medical facilities will probably be adequate since additional services are available in Craig, which is a 15-minute drive away. Ambulance service also is available to the hospital in Craig.

E. LEGAL JURISDICTIONS AND CONSTRAINTS IN TERMS OF COMMUNITY

When considering the possibility of a major future development within the study area, there is the need to focus on the regulations imposed by the various local governmental agencies. The regulations of concern are those adopted and enforced to control land development (subdivision regulations), the use of land (zoning), and construction of structures and related facilities (construction codes, i.e., building, plumbing, electrical, fire prevention). Within the context of these development regulations, the requirements for density control, sewer services, water supply, and various development standards are generally described in detail. However, the regulations found within the study area will have varying requirements, dependent on the standards set by the applicable enforcing jurisdiction. Often there are references to state regulations where a particular agency has control of some facet of development.

Amendment procedures are included in all three county zoning regulations and zone district designation processes. All the county and local governments concerned enforce the 1973 edition of the Uniform Building Code with amendments through April 1, 1974. The code covers building construction performance and electrical inspection.

Except for construction on existing lots of record, land development regulations are the primary control measure since subdivision will be necessary in order to develop a major housing supply. Any such subdivision of land must provide, by definition, building lots which will meet the requirements (or lot standards) set forth in the applicable zoning ordinance or zoning resolution or which will be of such merit that existing zone districting can be amended to accommodate the proposed subdivision. A common example of the latter case would be a planned unit development designed to provide for a mixture of uses and densities with adequate provision for open space and other amenities).

The communities of concern within the planning area are Craig, Hayden, and Meeker. Communities such as these are attractive to developers because utility services are generally available or expandable; however, the feasibility of any major development within the incorporated limits of these communities is questionable. It is, therefore, quite probable that any development venture looking to the availability of utility services or a municipal bonding arrangement will tend to locate in a community fringe area (generally outside corporate limits) and be subject to

county development regulations. Accordingly, county regulations are of prime importance.

1. COUNTY REGULATIONS

The regulations of general interest for the study area are subdivision regulations, zoning, and the building permit system. The basic purpose of subdivision regulations is to insure a satisfactory subdivision of land and the recording of an official plat prior to the sale of lots. Zoning is a legal document adopted by the governmental unit for the purpose of instituting land use controls and implementing an official land use plan (comprehensive plan). It usually consists of three parts: the zoning ordinance or resolution, the zone district map, and a schedule of zone district regulations. A building permit system, on the other hand, may be nothing more than a permitting system used as part of zoning administration, or it may extend to a full system of construction codes with standards for general construction, plumbing, electrical, heating and air conditioning installation, and fire prevention measures. The general requirements for the various regulations in force within the appropriate jurisdiction are described below.

a. Moffat County

Moffat County presently enforces subdivision regulations, zoning, and a construction code, as well as regulations covering individual sewage disposal systems. A separate ordinance prohibits location of a mobile home on an individual lot with an area greater than 35 acres designated for agricultural purposes. The regulations enforced are quite basic but adequate for the intended purpose.

The general requirements of the existing subdivision regulations are paved streets, graded and surfaced to a specified standard; sanitary sewage disposal; a storm drainage system; water supply; and public site and open space dedications and reservations. Where lots and parcels in a new subdivision cannot be connected to an existing public sanitary sewerage system, on-lot sewage disposal may be utilized providing that site conditions are adequate for a soil absorption system. However, where local, county, and regional master plans indicate that construction or extension of sanitary sewers may serve the subdivision area within a reasonable time, the governing body may require the installation and capping of sanitary sewer mains and

house connections in addition to the installation of temporary individual on-lot sanitary disposal systems. All utilities, including water supply, shall be provided consistent with the regulations of the Colorado Public Service Commission.

A section of the regulations provides for Planned Unit Development (PUD) which permits modification of the design standards providing that the overall design is not inconsistent with the intent and purposes of the Comprehensive Plan and the Subdivision Regulations (Section 2.020). PUD provisions allow the developer to pre-plan a development, to propose a mix of land uses and residential densities, and to locate residences in clusters. The PUD provisions have particular application for fringe area and satellite developments of a neighborhood or community size. While not so stated in the Zoning Resolution, the Moffat County Planning Director indicates that a major development proposal subject to the PUD provisions of the Moffat County Subdivision Regulations will be accorded appropriate zoning to permit the developer to carry out the planned development proposal.

Under present zoning regulations in Moffat County, residential uses are permitted in five different zones. The minimum lot size varies dependent on the availability of public water as noted in Table 27.

TABLE 27
MINIMUM LOT SIZES PERMITTED IN MOFFAT COUNTY

Use District	Minimum Lot Area Per Dwelling Unit		
	No Public Water or Sewers	Public Water	Public Water and Sewer
Agricultural	3 acres	21,530 sq. ft.	NA
Rural Residence	3 acres	21,530 sq. ft.	NA
Low Density Residence	25,000 sq. ft.	12,500 sq. ft.	7,000 sq. ft.
Medium Density Residence	12,500 sq. ft.	6,250 sq. ft.	3,500 sq. ft.
Rural Highway	3 acres	21,530 sq. ft.	NA

NA—Not Applicable

SOURCE: Moffat County Zoning Resolution

TABLE 22
The zoning resolution and the zone districts are subject to amendment as provided in the resolution.

The building permit system provides the means of implementing the zoning ordinance through the office of the Zoning Enforcement Officer. The regulations require the issuance of a building permit before the start of any construction for a proposed building or structure meeting the requirements of the Zoning Resolution as shown on the construction and location plans submitted with the building permit application. Following the completion of satisfactory construction, the Zoning Enforcement Officer issues a certificate of occupancy.

The regulations administered by the Moffat County Board of Health govern the installation of individual sewage disposal systems within Moffat County, including the regulation of wastes from dwellings and businesses, industrial and public buildings and the control of the construction, location, and operation of sewage disposal systems; the transportation and final disposal of sewage materials; and the control of systems contractors and systems cleaners. The regulations provide quantitative standards for sizing disposal facilities. The general policy is to require public sewer systems where and whenever feasible, and to limit the installation of individual sewage disposal systems only to areas where public sewers are not practical. Package sewage disposal plants are permitted provided that they meet the approval of the County Health officer, or have had previous approval of the Colorado Department of Health.

b. Rio Blanco County

Rio Blanco County presently enforces subdivision regulations, zoning, and a construction code, as well as regulations covering individual sewage disposal systems. The regulations enforced are similar to those of Moffat County with the exception of the following policy differences:

- No satellite community development
- No approval of land development projects proposed for areas three miles beyond existing incorporated communities unless there are public sewage disposal and water supply systems
- PUD regulations do not presently provide for any uses

other than residential and open space (the existing regulations are under study and subject to revision)

The general requirement of the existing subdivision regulations are paved roads (streets), graded and surfaced to a specified standard; sanitary sewage disposal; a storm drainage system; water supply; and public site and open space dedications and reservations.

Where lots and parcels in a new subdivision cannot be connected to an existing public sanitary sewerage system, on-lot sewage disposal can be utilized. However, the existing zoning ordinance provides for a minimum lot area of five acres in the absence of public sanitary sewerage and water supply systems. Where local, county, and regional master plans indicate that construction or extension of sanitary sewers may serve the development within a reasonable time, the governing body may require the installation and capping of sanitary sewer mains and house connections in addition to the installation of temporary individual on-lot sanitary disposal systems.

The regulations for developing mobile home parks are extensive. Important requirements are those for outdoor recreation areas (20 percent of park area in outdoor recreation area or areas); a potable water supply system (1,000 gallons/day/space with water pressure between 20 and 80 pounds); a public sewer system connection, or a private central collection and treatment center meeting the requirements and with the approval of the State Department of Health, the State Water Pollution Commission, and the County Sanitary Engineer.

Rio Blanco County has well-defined PUD regulations which require a minimum development size of at least five acres, dedication or reservation of at least 30 percent of the total area for open space, and a plan for continued maintenance of the open space.

Residential uses are permitted in five different zones. The minimum lot size is dependent on the availability of public water, as noted in Table 28.

c. Routt County

Routt County has subdivision and zoning regulations in effect which are more stringent than most basic regulations.

For subdivision purposes no lot shall be platted unless an economical and practical method of sewage disposal or a potable and dependable water supply is available or can be

TABLE 28
MINIMUM LOT SIZES PERMITTED IN RIO BLANCO COUNTY

Use District	No Public Water and Sewer Services	Public Water and Sewer
Agriculture (A)	5 acres	12,000 sq. ft.
Rural Residential (R-R)	5 acres	12,000 sq. ft.
Residential (R-1)	5 acres	9,000 sq. ft.
Multifamily (R-2)	not permitted	9,000 sq. ft. (3,000 sq. ft./dwl. unit)
Mobile Home Park (MHP)	not permitted	Park: 10-80 acres 5½ units per acre 4,000 sq. ft. for Mobile home 5,000 sq. ft. for double unit

SOURCE: Rio Blanco County Planning Commission

made available to each lot; however, individual sewage disposal systems are permitted if lot sizes conform to the zoning requirements. Individual wells are permitted on lots larger than five acres. Public sanitary sewerage systems and public water supply systems are permitted if constructed to meet the requirements of the Colorado Department of Public Health and local health authorities. The approval of such a system requires an established organization to administer operation of the system; this organization can be an incorporated place, a sanitary district, or an approved corporation or individual with a PUD permit.

Street paving of asphalt (or higher type) is required where average lot size is less than 10,000 square feet; otherwise, a gravel surface is appropriate unless the anticipated traffic warrants otherwise. The platting regulations also require a storm drainage system and fire hydrants.

2. COMMUNITY REGULATIONS

With respect to the study area, there is one incorporated community in each of the counties: Craig, Moffat County; Hayden, Routt County; and Meeker, Rio Blanco County. Each of these incorporated communities has an active planning

implementation program (subdivision regulations and zoning) and enforces the 1973 Uniform Building Code.

a. Routt County and the Community of Hayden

In terms of locational relationships, western Routt County and the town of Hayden are rather remote from the Colowyo Mine site. This remoteness places this part of the study area in a doubtful position for accommodating new residential development. Also, the Hayden area will have difficulty in accommodating local needs due to the proximity of the Colorado-Ute power plant. With existing housing conditions, many of the new residents will have to depend on accommodations available in the Steamboat Springs area.

The PUD regulations require that the finished development be consistent with the provisions of the Comprehensive Plan. A central system for both sewerage and water is required. The PUD must provide for the necessary commercial, recreational, and educational facilities conveniently located in relation to housing. There is a 25 percent "open air recreation or other usable open space" requirement, and provisions for continued maintenance.

Under the existing Zoning Resolution, Routt County is loosely divided into five development districts, as follows:

- Alpine District: Lands between 8,000-12,000 ft. elevation
- Mountain Park District: Lands between 8,00-9,000 ft. elevation
- Foothills District: Lands in the 7,000-8,000 ft. elevation
- Valley District: Lands in the 6,000-7,000 ft. elevation
- Urban Development District: Lands in unincorporated communities or the urban fringe areas of incorporated communities.

Lands in the Study Area fall within the Valley and Urban Development Districts. There are seven use district designations that permit residential uses. The minimum residential lot requirements for these districts are indicated in Table 29.

TABLE 29
MINIMUM LOT SIZES PERMITTED IN ROUTT COUNTY

Use District	Without Sewerage Facilities	With Central Collection and Secondary Treatment Facilities
Agriculture & Forestry (AF)	15 acres per unit	---
Mountain Resident Estate (MRE)	5 acres	1 acre
Mobile Home Residential (MHR)	none	5,000 ft. per space
General Residential (GR)	NA	½ acre/dwelling unit
Low Density Residential (LR)	NA	10,000 sq. ft./dwelling unit no more than 6 d.u. per acre
Medium Density Residential (MR)	NA	6,000 sq. ft./dwelling unit but no more than 10 d.u. per acre
High Density Residential (HR)	NA	3,300 sq. ft./dwelling unit but no more than 18 d.u. per acre
NA—Not Applicable		

SOURCE: Routt County Planning Commission

There are indications that the Routt County-Hayden governments would be amenable to accommodate new development; however, utilities would be a problem. Either the town of Hayden or the developer would have to build sanitary sewerage facilities. Moreover, there are few good development sites in the Hayden-Craig Corridor, as evidenced by Presentation Map 3.

b. Moffat County and City of Craig

Craig is indicated as a problem area when considered as a focal point for new development. The problem stems from the current policy of the governing body of not extending water and sewer mains to new development located in the urban fringe. The city will permit the developer to install the mains at the developer's expense, without rebate participation or tax credit. In other words, the cost of the length of a minimum 15-inch sewer main becomes a development cost that will not have to be shared by developers working in areas adjacent to the new line. This policy has served to limit new development in Craig and the community fringe area. For instance, the cost of the newest sewer main extension was borne entirely by Colorado-Ute Electric Association. While governmental policies in Craig have not served to encourage new development, the Moffat County government itself seems more receptive. Actual accommodation of new development, however, depends upon the availability of sewers and water. This policy requires either that developers (in the Craig fringe area) gain the support of the Craig city government or provide sewer and water facilities as part of the development. Utility systems will have to be provided by the developer for any development not able to utilize Craig utilities.

While there are a number of better than average development sites within Moffat County, particularly in the Axial-Craig corridor, the utilization of any site will be dependent on the availability of water.

c. Rio Blanco County and the Community of Meeker

The present policy of the Rio Blanco County governing body is that there will be no satellite communities and that all new development will have to be built within three miles of the two incorporated communities, Meeker and Rangely. Meeker, the logical community of interest, is about the same distance from the Axial site as Craig. Both the

county and city government apparently are seemingly interested in new development. Due to the small area of Meeker, any new development will have to be in the fringe area primarily to the northwest. The area has much to offer in the way of development sites. However, much of the land is in agricultural production and the county as well as city government will not allow development in these areas. The prime limiting factor, however, as described earlier in this section, would be provision of utilities.

The general feeling is that Rio Blanco County will impose higher standards of development and that while there is an interest in attracting people and a larger economic base, steps will be required to guarantee that the existing life style will at least be maintained, if not enhanced.

3. NEW COMMUNITY OR NEW TOWN DEVELOPMENT

If properly planned and built, a new community development can bring considerable prestige to the sponsor. It provides assurance of a housing supply for employees, and it is also an aid in maintaining employee satisfaction. It is not realistic, however, to expect all potential employees to live in such a development. There are those who will bypass a new community development to live in established communities such as Craig or Meeker or even smaller settlements. Accordingly, a choice of housing sites is desirable. To this end, it is probably best that new development in both Craig and Meeker be encouraged in addition to provision of a new community or new town development if necessary. The definition of a new community is a development which is either adjacent to an existing town or which is a satellite of an existing town. A new town is defined by the State of Colorado as a free-standing community that does not rely on an existing town for support facilities.

To create a new community, thousands of acres of land, generally on the fringe of an urban growth area, must be acquired, sometimes from numerous landowners. The land must be managed until it is developed. Uses must be planned and delineated and legal-political approvals must be obtained prior to implementing those plans. Capital for both land acquisition and planned improvements must be secured. Roads, sewers, water lines, parks, and other amenities must be constructed if the new settlement is to attract housing, jobs, commercial investment, and institutions for the health, education, and welfare of future residents. In addition, the administrative machinery to operate a new urban environment must be assembled once the

decision is made to develop a new community.

In summary, the major factors in new community development include the large investment of time, dollars, and talent required, and the development of the capacity to manage a multi-factional organization and to solve a myriad of social, political and economic problems over a construction and marketing cycle which can run two decades into the future. As a private business venture, the development of a new community constitutes an effort to create and retain urban values on rural land in a rural setting.

a. The Historical Perspective

During the two decades between 1920 and 1940, there were 63 new town developments initiated in the United States. None of these were finished as planned. In general, the proposed developments failed to attract industry, generate sufficient technological interest in mass housing, or involve private investors able to sustain the large unit costs and low unit profits. During this period, the planning for new towns was motivated largely by the desire to demonstrate good principles of public planning. The economic demands necessary for satisfactory completion were greatly underestimated, and the initiators of these projects ignored the need to develop an economic base including industry and commercial activities.

These early new town developments included attempts by the federal government, dating back to the 1930's, to develop four "greenbelt" towns as part of its resettlement program carried out by the U.S. Department of Agriculture. The three actual towns begun under the program--Greenbelt, Maryland; Greenhills, Ohio; and Greendale, Wisconsin--were not completed because of Congressional disapproval and lack of funds. (One community planned for a New Jersey location was defeated in the courts.) The weakness in the concept was, again, the lack of an economic base. People continued to move into the adjacent metropolitan area because of the better employment opportunities and because commuting to the suburbs had yet to become a way of life. In the late 1950's, Greendale was taken over by private enterprise and recent new communities being built with federal assistance are described in the following section. To some extent, the more recent new town developers have moved to the other extreme. The later emphasis is and has been in the accommodation of a private investment objective

and the operation of the private market. There now seems to be a need for a more central position. The new communities of the past decade or so have tended towards what has been described as huge company towns. To remove this stigma, current thinking is that major interest groups need to be brought into the decision-making process and that planning methods will need to recognize broad community development objectives in addition to profit realization goals.

b. Constraints to New Community Developments

Aside from the traditional problems with land acquisition and development costs, the major constraints to new community development are the capacity of local government to supervise and serve the creation of a new environment and the lack of public policy for regional development.

In the first instance, local governments are generally without the type of zoning and development standards which permit the density, diversity, and flexibility required to plan and execute a single project on hundreds of acres at a rapid pace within a limited number of years. A new community developer can spend costly time drafting and selling appropriate zoning to a local jurisdiction. Beyond the development approval difficulties, local governments seldom have the organizational structure necessary to expedite the myriad public approvals normally required by the private sector in the planning, design and development processes. For the developer, delays in public approvals can cause serious risks and costs, particularly during the critical early stages of development when financial risk is the greatest.

Finally, local government, restricted by law and politics, is not always inclined to or capable of working cooperatively in providing community infrastructure and amenities for a new community project at a quality and pace required by the developer. It is generally difficult for local officials to increase taxes across their jurisdiction to meet the demands of new inhabitants. The ability of local government to finance costly improvements through tax exempt bonds is restricted by state laws that govern local government debt capacity on the basis of existing rather than projected tax bases. As a result, the private sector must absorb the cost of major components of the physical facilities system for a new community that would be the financial responsibility of local government if the area were to develop by the normal processes of urbanization.

The situation is further complicated by the role of the developer as an outsider with no power base of his own. In contrast, the local public officials are in a position to lose the most politically by the change in voting structure that the new community will eventually produce.

With respect to the lack of public policy for regional development, private enterprise is seldom able to plan and implement new communities within the framework of well-articulated and administered policies relating to regional land use patterns. To obtain local zoning it is often necessary for the new community developer to accept a project-wide density that is close to the existing allowable residential density of the approving jurisdiction. Supposedly, this permits development of a new community which will not substantially increase the number of dwellings and related costs beyond that which would eventually occur with normal development. As a result, new communities in the United States are often planned and built to extraordinary low densities determined by local political expediency rather than sound physical or economic criteria developed in the regional context.

Another problem is posed by the small builder-developer who locates on the edge of new communities for the singular purpose of capitalizing on the new community developers' investment in infrastructure and amenities. In this manner, the builder-developers capture part of the market essential to bring the new community through its critical early stages. A protective belt of land or "greenbelt" is necessary not only to protect the developer's investment but also to provide an important amenity. However, the private sector is seldom able to afford an effective greenbelt, and regional land use policy is usually lacking to guide and protect development.

Another area of public policy where a regional context is lacking is the administration of property taxes. As a result, taxes sometimes place a severe economic penalty on the new community developer. Local taxing jurisdictions often move to tax a new community at its potential urban value as soon as it is zoned. This policy considerably increases the carrying charges on the land as well as the financial risk.

Some of the costs and risks associated with the lack of regional land use and taxing policies might be alleviated if there were adequately documented, scheduled, and administered policies for the provision of regional infrastructure components (reservoirs, sewage treatment facilities, public transportation) and major public facilities,

schools, etc. Too often, however, the private sector is confronted with opposition from agencies responsible for planning regional public facilities and/or the lack of adequate regional planning mechanisms.

c. Criteria For New Community Site Development

The primary characteristic of the new community concept is the clustering of urban-type development in a manner which fosters the conservation of resources and the preservation of open space. From a practical standpoint, new communities are envisioned as a highly useful vehicle for providing low cost housing in suburban rural areas and for providing housing close to job locations. The development of new communities on a neighborhood basis may have a more practical application for the new community developer than for conventional city planning.

The criteria governing site selection for a new community fall into two categories: political and physical. Political decisions determine possibilities and constraints within a jurisdiction. The physical aspects tend to focus on particular areas within a jurisdiction.

An overriding political criteria for Colorado development relates to the state land use law which permits the respective Board of County Commissioners to veto a new community proposal within its jurisdiction. (Reportedly, Rio Blanco County Commissioners are not willing to approve any new community proposal.) Other political criteria relate to the possibility of receiving appropriate zoning and the availability of infrastructure funding.

Physical criteria for new community development vary initially with respect to the type of development. Where the new community is to be built adjacent to an existing community, much of the physical site selection criteria can be ignored. Presumably, water supply and sewerage facilities are available, limiting physical constraint aspects to such factors as excessive slope and the presence of flood plains.

The physical criteria are quite different for new communities built in remote locations. Due to the nature of the Rocky Mountain area, the availability of water is the most important factor, provided the location is readily accessible to the people to be served. Once water availability and locational factors are satisfied, it then becomes a matter of considering geological factors and

environmental impacts and satisfying the political aspects.

Once a site is selected, one of the first decisions to be made by the local government and/or the developer will be concerned with the range and level of facilities to be provided in the new community. While accepting the fact that transportation and water supply and sewerage facilities are necessary, some would question that open space and recreation facilities are justifiable. After all, public facilities, for the most part, have been built by local government as a response to urban growth. Traditionally work was done in stages starting with basic facilities, e.g., water and sewer system, to those that were considered social amenities, e.g., parks, recreation facilities etc. The staging of facilities generally was the result of competing demands for limited financial resources; those facilities which were judged the most vital to the health and general welfare of the residents got initial priorities while social amenities had to wait.

The "wait and see" approach is unacceptable for new community development, however. One of the prime advantages of such new settlements is the provision of a better urban environment than is available elsewhere. This means that a full range of public facilities should be part of the community from the beginning.

In this context, the distinction between basic public facilities and social amenities is rather meaningless. A park is just as important as a school. The water system and a civic center are equally important to the welfare of the residents. Each is a necessary integral part of the total community. Each must be planned, designed, and installed as an operational unit before the new community begins to function as a place to live.

d. The Framework For Future Development

Once the development decisions have been made, a formidable task faces the developer: establishing the basic physical framework for the future development. A major component of this framework is what is often referred to as the "urban infrastructure." The phrase generally refers to the total complement of physical structures and facilities which provide those essential services which are vital to a community's health and general welfare.

The urban infrastructure includes the water and sewer systems, the open space network, the basic utility networks

(telephone, electric power, and natural gas), and a number of structures generally referred to as "community facilities" (e.g., police and fire protection facilities, education and health facilities, refuse collection and disposal facilities, and community civic and recreation centers.)

The provision of public facilities and services has been viewed historically as the responsibility of the local government (county or municipal) which constructs and owns the facilities. In too many instances, however, the local governments are ill-equipped financially or organizationally, to assume this responsibility. Since many of the current new communities are being sponsored by private corporations, the installation of these facilities is often viewed as the responsibility of the private enterprise which has an investment to protect. In this case, the corporation usually does the work under franchise and under supervision by a public body.

e. Federal Assistance For New Communities

Federal assistance for new communities was provided for under the Urban Growth and New Community Development Act of 1970 (Title VII of the Housing and Urban Development Act). In 1974 the status of new communities applications made in 1973 was as follows:

- Ten new communities were under guarantee contract with HUD and in the implementation stage;
Seven new communities had received letters of intent to approve from HUD (of these, two, Roosevelt Island and Lysander, applied for certification only and not for a guarantee);
Five new communities had a full application under review by HUD;
Thirteen new communities were in the preapplication stage.

The New Communities Administration expected to approve a total of three or four new communities within fiscal year 1974 and another five or six communities within fiscal year 1975; however, in early 1975 the U. S. Department of Housing and Urban Development announced the end of the program. While existing "new communities" will not be abandoned, Department spokesmen explained that there was not enough money to complete existing "new communities" and start new ones. A total of 16 new community development projects have received Department funding.

4. RECENT COLORADO STATE LEGISLATION THAT MAY AFFECT COMMUNITY DEVELOPMENT

In addition to ordinances, acts and regulations mentioned elsewhere in this report, two bills which have been passed recently by the Colorado State Legislature, may affect community development processes. These are House Bills 1034 and 1041, both adopted in 1974. These bills are included in Appendix C.

House Bill 1034 (HB1034) is called "The Local Government Land Use Control Enabling Act of 1974," and reads as follows:

"The general assembly hereby finds and declares that in order to provide for planned and orderly development within Colorado and a balancing of basic human needs of a changing population with legitimate environmental concerns, the policy of this state is to clarify and provide broad authority to local governments to plan for and regulate the use of land within their respective Jurisdictions. Nothing in this article shall serve to diminish the planning functions of the state or the duties of the division of planning. (106-8-102.)"

This act further clarifies the regulation of use and planning for the following area:

- Regulation of development and activities in hazardous areas
- Protection of lands...which would cause...material danger to significant wildlife habitat ...(or) specie
- Preservation of areas of historical and archaeological importance
- Regulation of...establishment of roads on public lands administered by the federal government...
- Regulation of...the location of activities and developments which may result in significant changes in population density
- Provision for phased development of services and facilities

- Regulation of the use of land on the basis of the impact thereof on the community or surrounding areas
- Otherwise planning for and regulation of the use of land so as to provide planned and orderly use of land and protection of the environment in a manner consistent with constitutional rights (106-8-104).

House Bill 1041 (HB1041) was passed to complement HB1034 and to provide the administrative structure and funds to comply with HB1034; it reads as follows:

(This bill is) "concerning land use, and providing for identification, designation and administration of areas and activities of state interest, and assigning additional duties to the Colorado Land Use Commission and the Department of Local Affairs, and making appropriations therefor."

To paraphrase the contents of the bill, the general assembly designates environmental problems as matters concerning the public of the state; and that it is the purpose of the state to "describe areas which may be of state interest and establish criteria for the administration of such areas and activities." Local governments are encouraged to designate areas of state interest and administer such activities of state interest and promulgate guidelines for the administration of these areas. The primary areas of concern are those which are listed in Bill 1034; however, these definitions are expanded in HB1041 to include key facilities (i.e., airports, utilities, rapid or mass transit terminals, as well as highways), flood plains, water rights, environmental hazards and natural resources.

The strength of this bill lies with the administrative authority of the jurisdictions of local, regional and state agencies. Briefly, it is the responsibility of local government to designate areas of state interest, describe intensity of growth, utilize state guidelines for designation, hold hearings, review and act upon development permits for these above mentioned areas, recommend and receive recommendations for matters of state interest (106-7301), and act upon requests of the Colorado Land Use Commission.

The functions of State agencies are to "Recommend designation of matters of state interest; provide technical assistance to local governments (106-7-302)."

This bill also provides funds to set up and administer the above activities. The bill appropriated \$2,075,000, of which \$1,575,000 was designated for local administration (or \$25,000 per county and municipality), \$500,000 for supplemental planning and \$300,000 supplemental county funds available July 1, 1975. In short, funds went to every county and municipality and state agency upon petition. All but four municipalities have applied and received this money. Willingness to comply with this bill was assumed by receipt of the funds.

There are many problems related to the administration of this bill. The municipalities have used these funds to set up the administrative portion of this bill; however, enactment of the programs is not financed. Basically the bill calls for a land use plan which will necessitate a survey of each of the items mentioned in both bills. The ability for municipalities to comply with this in a timely manner is doubtful. Council of Governments (COG) Region 11 is currently assisting Rio Blanco and Moffat Counties and communities with the translation of this bill as it applies to their areas.

The relationship of HB1041 to community development on the Western Slope will be noticeable in months to come. Obviously, any future development will be evaluated in terms of HB1041 and the regulations it contains.

V. GROWTH AND COMMUNITY ATTITUDES

A. HISTORICAL PERSPECTIVE

An influx of new population has traditionally had an impact on the way of life of residents in the Meeker-Craig area. The first group to feel the effects of growth was the Ute Indians. During the 1820's and 1830's, fur trading became the dominant economic activity in the area. Mountain men from Mexico and the United States established trading posts in and around the region. The northern Utes became involved with fur trading and learned of the white man's culture. The influence of fur trading lasted only until styles changed and sources were depleted.

In the 1850's, the cattle industry began to thrive in the area. The Indians, accustomed to a working relationship with the fur traders, accepted the new group of white men peacefully. The practice of open grazing slowly depleted the traditional hunting grounds of the Indians, forcing them to steal livestock to maintain their existence. This helped to set the stage for the Meeker Massacre and the Thornburg Battle. These two events led to the removal of the Indians to reservations in southern Colorado and eastern Utah which allowed the white settlers to acquire more property.

Around the turn of the century, sheep were introduced into the area, and cultivated cropland began to take precedence over land reserved for open grazing. Although hostilities did not develop between cattle and sheep ranchers, the sheep ranchers eventually dominated the land available for grazing.

Since the turn of the century, the agriculturally based economy of the area has evidenced a relatively steady pattern of growth. Craig, the county seat of Moffat County, is now one of the largest shipping points for wool in the country and is one of the largest in the state for cattle. On the other hand, mineral-related development has been a "peaks and valleys" situation dependent on the demand for coal.

In 1913, the Denver and Salt Lake Railroad (D & SL RR) planned to extend its facilities to Salt Lake City. This expansion was expected to create an economic "boom" in the area. Financial difficulties, however, limited the expansion, and the railroad was forced to terminate in Craig.

During World War II, Texaco constructed a refinery in Craig for its oil fields. In 1948, the refinery was shut down in order to consolidate refining facilities in Casper, Wyoming. The economic growth expected for the community again was not realized.

The erratic nature of mineral-related development has left residents skeptical regarding growth. Prior to 1966, for instance, there were 19 operating coal mines in the area. Due to changing economic conditions, only one was in operation as of 1966; there are now three operating mines. Although economic growth is seen as beneficial to the area, there is the fear that mineral-related growth is temporary, and that after a limited period of expansion, the economy once more will experience a decline.

B. PUBLIC OPINION SURVEYS

Four public opinion polls covering a wide sampling of the population were conducted recently in the study area. They present a relatively complete sociological profile of the potentially affected communities and also aid in identifying topics that typically concern residents regarding new growth.

1. CRAIG OPINION SURVEY

Social Change Systems, Inc., subcontracted by VTN in October, 1974, conducted a survey among residents of Craig. The purpose of the survey was to learn from residents of Craig their concerns, hopes, fears and reactions to growth in the area. They sampled every twentieth household in Craig, for a total of 87 respondents. Appendix G contains a copy of the questionnaire and a description of the resident sample.

Respondents in the Craig sample were, for the most part, in favor of growth. Events in the past, however, have forewarned residents of the economic effects of a boom followed by a depression. In the 1950's and 1960's, an interest in uranium caused a sudden increase in population accompanied by an increased need for housing and facilities. The uranium exploration was temporary, however, and the new population left the area, leaving the remaining residents with a larger supply of goods and services than could be supported by the population. Therefore, when the residents were asked whether they would want a temporary increase in population, 80 percent responded negatively. The majority of respondents (57 percent) were also of the opinion that the present rate of growth was too rapid. Basically, the people of Craig, as represented in this sample, desire population growth, but within limits and with important qualifications.

Approximately 25 percent of the sample would like to see the community increase to over 10,000 population. About half of those questioned responded that a desirable maximum population for the city would be 8,000 or less, and that the county should increase to no more than 12,000 people. Another 25 percent limited the increase in the population of Moffat county to 15,000 people. Any increase in growth, however, requires proper planning and development. According to two-thirds of the sample, development has been handled poorly in the past, has been too limited, or has been favorable only to a few.

An analysis was made of those respondents favoring growth. This group consisted primarily of individuals between 30 and 49 years of age, married persons and parents with young families, men, home-owners, people with white collar occupations, and those with higher educational and income levels. The less established residents tended to discourage growth. It should be noted that it is not simply one group being pro-growth and the other anti-growth, but that a relative difference exists. A majority of all groups rejected temporary growth, but the margin of rejection was less among some groups.

The benefits and costs accompanying growth were identified by the residents sampled. More job opportunities, better incomes and wider choices of shopping facilities were seen as benefits, while overcrowded schools, loss of small town atmosphere and increased crime were seen as costs of growth. Most respondents felt that while merchants and businessmen would benefit, that older people and others on fixed incomes would suffer from growth.

Residents were asked which community facilities or services they felt would be most overburdened by growth; as a separate question they were asked which ones they felt would be the first ones to be developed. In both cases, schools, water and sewer service, and medical facilities and staff ranked at the top of the list. When asked about the reaction of government to growth, about two-thirds of the respondents expected that the city council and the county commissioners would become more responsive to the people as the town grew.

When asked about impacts to the natural environment of the community, 65 percent of the respondents thought there would be a negative impact to the area, with air pollution, strip mining, and a loss of wildlife being the most severe results projected. About 25 percent saw no impact, and only 10 percent felt there would be a positive impact on the natural setting. In order of degree, strip mining, population growth, hunting, and power plant construction were seen as major threats to the natural environment. The respondents

were then asked to list both positive and negative results of growth on the physical appearance of the town. Possible improvements were better sidewalks and streets, a revitalized and cleaner downtown, and new housing. Possible detriments were crowding and more mobile or other temporary housing creating a less visually attractive environment.

The research survey included a series of questions designed to determine people's perception of growth impacts on their social life. Respondents were first questioned about their present sense of community. About 40 percent felt there was a strong sense of community, another 40 percent felt the sense of community was present but not very strong, while only 11 percent perceived a weak sense of community.

When asked how they felt about more diverse groups of people entering the community, slightly more than half the respondents thought this would have both positive and negative consequences for the town, 38 percent felt it would be only good, and 9 percent felt it would be only bad for Craig. When asked if they thought various existing social conflicts would be heightened or lessened with growth, respondents saw possible increases in racial tension and crime, although 35 percent could see no such increased social conflicts. Most people (70 percent) thought that social tensions would not be lessened as the town grew, although a number felt that a greater tolerance for differences would develop. When questioned how new residents would be treated, 52 percent responded that new residents would experience adjustment problems, although 65 percent felt that the town would welcome new residents. It is possible that adjustment problems would occur from the reaction to the relative isolation, the severe winters or to the limited number of amenities available in a town the size of Craig.

Another event that could occur with growth is competition between established and new residents for community leadership positions. Most respondents did not foresee this occurring, nor did they envision a lack of people to fill these leadership positions.

Respondents were asked who they thought should be responsible for the costs of expanded facilities needed for new growth. They were asked specifically who should be the first and the last to pay. The rankings, in order of precedence, were new industry, developers, incoming population, merchants, and existing population. Approximately one person in five suggested that all parties share growth costs.

A series of questions were asked regarding suitable growth areas in and around Craig. Regarding physical growth of the city, respondents favored additional annexation by a five to

three margin. Those favoring annexation said that they would support only necessary expansion; those opposing annexation thought the city should try to improve existing facilities before attempting expansion. The physical limits of the city are not presently clearly defined. Only 50 percent could identify the city boundaries; however, more than half the sample did not feel that a clear sense of boundary definition was important.

When asked about the viability of a new town, 55 percent felt that growth should occur primarily in existing towns, and 37 percent thought growth should occur in both existing towns and new towns. Only 5 percent thought that growth should take place primarily in new towns. If a new town is developed, 69 percent thought it should be near the mine rather than near Craig. The majority of respondents indicated that any new town proposed should be in a 6 to 25-mile range from Craig. Only about 15 percent wanted to see a new town closer than 6 miles.

2. MEEKER OPINION SURVEY

Another survey identifying problem areas relating to growth was conducted among residents of Meeker, Colorado by the Rio Blanco County Planning Department. Questionnaires were distributed to all households in Meeker, and a 35 percent return (350 responses) was obtained. The planning department is still compiling some of the data, so questions that asked for comments are not included in this discussion. A copy of the questionnaire is included in Appendix G.

Residents of Meeker are aware that growth is going to occur. The major concern of the community is to ensure planned growth. When questioned as to a desired population level, 18 percent responded that they would prefer no growth, while 60 percent would like to see the town grow from 3,000 to 5,000; 18 percent, 6,000 to 10,000; 3 percent, 10,000 to 15,000; and 2 percent, over 15,000.

There was a different reaction on the part of the respondents as to where growth should be focused. Sixty-one percent of the respondents disagreed that resource development should occur in Meeker, and 51 percent responded favorably to a question about new towns being established to handle the resource development. This centering of growth outside existing communities could be a reaction to speculation regarding oil shale and to discussion among developers about establishing a new town.

Within the limitations of the research techniques used in the study of Meeker, the same concerns voiced in Craig were mentioned in Meeker. Both communities are aware that growth is inevitable, and both communities would like to have the time and the funding to prepare for this growth. As in the Craig study, 83 percent of the residents felt that developers (equated with new industry in this case) should assume the total cost of new city services. The study done by the Rio Blanco Planning Department, however, did not have the controls the Craig study had. The respondents self-administered the questionnaire, and several of the questions could have been misleading. Also, in many cases, some respondents did not answer several of the questions; therefore, the answers are not consistent.

3. OIL SHALE DEVELOPMENT SURVEY

The Oil Shale Regional Planning Commission recently published a report entitled Attitudes and Opinions Related to the Development of an Oil Shale Industry: Regional Development and Land Use Study. This document presents the results of personal interviews taken among 592 residents of Garfield, Mesa and Rio Blanco Counties concerning oil shale development. The survey, a 22-page questionnaire, was conducted during January and February, 1973.

Although attitudes toward development of the region varied depending on the area, most residents favored growth and viewed it as socially and economically beneficial. Nearly one-third of all respondents were of the opinion that oil shale development would help local communities by generally improving the economy.

Most respondents favored population growth resulting from mineral development; however, when asked whether they could anticipate any event that would cause living conditions to deteriorate in the near future, 70 percent thought the most negative effect would be the occurrence of uncontrolled population growth. The consequences of inadequate planning for the future were also mentioned, including overcrowding of schools and housing shortages. Most individuals interviewed thought any potential negative effects of oil shale development could be avoided by responsible planning.

The results of the study agree with the results of the surveys conducted in Craig and Meeker. Respondents in all studies are aware that growth is going to occur and that growth will have both beneficial and adverse impacts. Beneficial impacts are perceived as those relating to

improving the economy and providing more jobs with higher wages while anticipated. Adverse impacts are overcrowding of schools and facilities, and the fear that small town amenities would be destroyed.

4. RESOURCE CITY ANALYSIS

A profile of possible effects of rapid population growth is presented in Resource City, Rocky Mountains. This document, ^{GET} prepared by the Federation of Rocky Mountain States, Inc., is a hypothetical model delineating the major problems experienced in boom town areas. The goal in publishing this model was to point out major problems and to prompt private and publicly sponsored planning agencies to solve these problems before they occur. A listing of the most obvious growth-related problems are as follows:

- Small communities existing in potential mineral-related development areas have not witnessed major growth, and are, therefore, unprepared for environmental and "people" impacts resulting from mineral development.
- These communities face housing shortages. Public utilities are inadequate to service increased needs. Schools are at or beyond capacity and are incapable of facilitating any increased enrollment. Hospitals, community and commercial services, transportation networks, and police and fire services quickly become overtaxed.
- Although the tax base is increasing, the need for services grows at a faster rate than revenues. Government officials are trying to shorten the inevitable lag between the time a boom begins and the time the tax base increases enough for the government to provide adequate services. As deficiencies increase, the time lag needed to facilitate demand also increases.

The results of population increase are as follows:

- The housing inadequacy is met by tent and trailer camps crammed into canyons, ravines or open fields and packaged onto odd-shaped lots. Play areas for children are nothing more than mud pads between trailer spaces. The rent for these is prohibitive, usually between \$85 a month to \$85 a week.

- Land available for development becomes scarce, and prices are inflated.
- Problems occur regarding water supply and water quality. Wastewater treatment facilities are overloaded, eventually causing water pollution of streams and rivers.
- The crime rate increases; an increasing number of students leave high school for the available non-skilled jobs; suicide rates rise, although the suicides rarely being fatal indicate a plea for help; and the incidence of alcoholism is often three times greater than in non-boom towns. Child abuse is often prevalent.
- Hospital facilities are so inadequate that cases other than first aid must go to larger cities for treatment.
- The social amenities are inadequate. They usually consist of bars, a small park, and a bowling alley. Inadequate school curricula and facilities and informal church organizations meet the needs of some of the population. The few civic groups that existed before the boom can accommodate only a few of the thousands who come to the community.

The effects of unplanned growth upon industry are monumental:

- A high employee turnover rate is evident despite high wages, primarily due to unpleasant living conditions.
- Wages skyrocket for key trades and unskilled jobs, upsetting the old wage and price relationship in the original economy.
- Absenteeism becomes a serious problem during the construction phase, as is finding and keeping skilled workers. The result is delayed construction schedules.
- Turnover rates have run as high as 40 percent per month. It has been noted that it takes ten days to a month before a worker becomes effective. Losses due to the necessity for rehiring and retraining workers run into millions of dollars.
- Conflicts with local businesses arise where power plants and mines lure municipal and service-related employees to the higher paying jobs. Town wages, therefore, must increase in order to keep up with

the competition. Inflation results as prices increase to cover higher wages.

The conditions described are not exaggerated. They do exist and could develop in other Rocky Mountain regions.

5. HANNA BASIN, WYOMING SURVEY

With funding from the Wyoming Department of Economic Planning and Development (DEPAD), Tom Bougsty, a graduate student at Colorado State University, conducted a socioeconomic survey of Hanna, Elmo, and Elk Mountain, Wyoming. The study sought to develop a demographic profile of a mining community and to determine community attitudes toward growth and deficiencies in existing community facilities and services.

It is useful to study this survey in that the three Wyoming communities, collectively known as the Hanna Basin, are similar to the Moffat County area. The Hanna Basin has recently faced sudden extreme population growth with increased mining activity. It has a significantly large mining population. The Hanna area itself is not unlike the Craig area, and it is less than 150 miles from Craig. Both areas would, therefore, be likely to experience similar growth-related problems. This information could be useful in anticipating a new population's needs for public facilities and housing and in anticipating problems a new population would face when entering a community.

Students at the high school in Hanna distributed the questionnaire to every household in Hanna Basin. The community is known to be supportive of the schools, so it was judged that this would be a good way to insure a high response rate. The completed questionnaires were collected a few days after distribution. There were 235 completed questionnaires returned for a response rate of 70 percent (see Appendix G).

The study was originally planned for a mining community, with comparisons made among miners, construction workers, and the non-mining residents. Since only 15 construction workers responded to the survey, it was felt that this was too small a sample for any responsible comparisons. This report was, therefore, confined to miners, non-miners, and the community as a whole.

A total of 235 households participated in the survey. These households included 779 members, for an average household size of 3.31 persons. The mining population (74 households)

was characterized by a somewhat larger household size of 3.54 persons. Some of this variation can be explained by the method of analysis. Since respondents listing mining as an occupation were singled out for separate analysis, retired persons were necessarily excluded. Retired persons generally live in smaller households, primarily because their children have left. Hanna Basin's average household size was substantially larger than that of the U.S. average of 3.01 persons per household.

Among the mining population surveyed, there was an overwhelming number of married persons (almost 90 percent) and no widowed, divorced or separated persons. In Hanna Basin as a whole, 83.8 percent of the household heads are married; for the U.S., 67 percent of the household heads are married.

The mining population of Hanna Basin is generally younger than the total community population, with a concentration (41.9 percent) of household heads between 19 and 29 years old. This age distribution for miners is significant in that over 62 percent of the household heads are in the child-bearing and child-rearing ages (19 to 39 years). In other words, this age group is more likely than any other to have large families and to demand more in terms of public services, schools and housing. In fact, of the mining household heads between the ages of 19 and 39 years, 80 percent live in households of three or more, and 54 percent head households of four or more.

The mining population in Hanna Basin has a significantly higher educational attainment than the Hanna Basin population as a whole; however, the Hanna Basin population is generally better educated than the total U.S. population. The high educational attainment of the mining population has implications for its perceptions and expectations of its community. More educated persons have higher expectations of community services and housing and can be more critical when their expectations are not met.

Family income for the mining population is significantly higher than that for the Hanna Basin population as a whole. The entire community can be characterized as a middle income group, with few families having extremely high or extremely low incomes.

As might be expected, the mining population of Hanna Basin is somewhat more transient than the non-mining population. About 62 percent of the mining population has lived in Hanna Basin for less than six years, while only 45 percent of the non-mining population has done so. When the mines began operation, Hanna's labor supply was limited, and new

people moved into the area to fill the mining jobs. Of the miners who have lived in Hanna Basin for less than six years, 80.6 percent moved there from other places in Wyoming or from Colorado.

When asked how many years they expected to stay in Hanna Basin, most respondents (74 percent) did not answer in terms of number of years. Instead, they indicated a desire to settle down (20.4 percent), uncertainty (31.1 percent). The tendency to make future plans contingent on work availability was, predictably, more pronounced among miners. More than 43 percent of miners indicated that they would stay if work were available, and 19 percent were uncertain.

Nearly half (48.7 percent) the miners indicated that they had lived at their last place of residence for fewer than six years, and only 36.6 percent of the non-miners indicated fewer than six years spent at their last residence.

Although the mining population is somewhat more geographically mobile than the non-mining population, of the miners who responded to the survey, more than half expressed a desire to stay in Hanna Basin; additionally, the miners are mobile within a fairly limited area, principally the states of Wyoming and Colorado.

More than 55 percent of the Hanna Basin population now lives in single-family homes. Another 35 percent lives in mobile homes, with the remainder living in apartments. A larger proportion of miners live in mobile homes and apartments (55.4 percent). A majority of non-miners (60.2 percent) live in single-family homes.

More dissatisfaction with their present home was expressed by mobile home and apartment dwellers than by single-family home dwellers. More than 25 percent of mobile home dwellers indicated uncertainty or dissatisfaction with their residence, 23.8 percent of apartment dwellers did the same, but only 11.5 percent of single-family home dwellers expressed these feelings. The number of apartment and mobile home dwellers actually dissatisfied with their present residence may be higher than that indicated by responses to the direct question about satisfaction with present dwelling. When asked what type of housing they would like to see developed in Hanna Basin, 67.5 percent of mobile home dwellers and 57.1 percent of apartment dwellers indicated a preference for single-family home development. More than 70 percent of all miners expressed a desire for single-family home development. It is likely that many of the miners live in mobile homes because of shortages of conventional housing rather than by choice.

Respondents were asked what specific features they looked for when seeking housing in a new community. Most of the features mentioned could be grouped into three categories: surroundings or environment; public facilities, including utilities, schools and streets; and actual features of the dwelling unit itself.

The most frequently mentioned category was surroundings (43.6 percent of all responses), with attractive neighborhood and location being the most important features within this category. The second most frequently mentioned was actual dwelling unit features (34.4 percent), with quality of construction most important. The third was public facilities, with schools (quality and location) being by far the most important consideration. Miners showed little difference from the total population in their responses to this question.

When a community's population drastically increases with the introduction of new economic activity and the new population is somewhat different from the longtime residents with respect to its characteristics and values, problems can arise concerning the integration of the new population into the existing community. The new population can easily feel isolated and alienated from the established community, while the old residents can feel that their established values and way of life are threatened by the intrusion of newcomers. One way to measure isolation is to analyze social contacts, their variety, and sources for each group. The Hanna Basin survey respondents were asked where they met most of the people with whom they socialized most frequently. Of the miners who answered this question, 83 percent indicated that they met most of their friends at work, 42 percent met most of their friends in their neighborhood, and 22 percent met friends in local bars.

The non-mining population showed less dependence on work, their neighborhood, and bars as sources of social contacts, depending more on church and clubs. When length of residence was compared to sources of social contact for the mining population, a similarity appeared. As length of residence increases, dependence upon work and bars for social contact decreases, and dependence on church and clubs increases.

Respondents to the survey were asked what things they liked least about living in the area. Most responses fell into eight categories: transportation related problems, lack of recreation, lack of medical services, poor utilities, climate, lack of community involvement, lack of commercial services, and environmental problems. There was some difference between miners and the total Hanna population as to how often certain categories were mentioned. Transpor-

tation-related problems, lack of recreation, and lack of medical services were perceived as the most serious problems by both groups. The total population ranked poor utilities and lack of community involvement as important problems. Both of these problems are ones that would be better perceived by long-time residents than by newcomers.

Miners mentioned problems more frequently than did non-miners. Miners mentioned an average of 1.6 problems each, while non-miners mentioned an average of 1.3 problems each. There could be several reasons for this. Many miners are new to Hanna Basin, having moved there from other communities. As a result of their relative transiency, they may be more aware of community shortcomings, especially if they moved from a community with better public facilities and more abundant housing and services. Also, it may be that miners feel some alienation as a result of being less well-integrated into the community than established residents. An alienated person is more likely to perceive problems. It may also be that the miners, being generally better educated than non-miners, have higher expectations of the community in which they live.

Respondents were also asked what things they liked most about living in their area. Respondents most frequently mentioned opportunities for outdoor recreation, the size of the community, and the people. Miners appeared to be more satisfied by the area schools and by their jobs than did the rest of the community. The non-miners appeared to appreciate the environment (lack of pollution, open vistas, quiet) to a greater degree than did the miners.

There were not as many things mentioned which are liked about living in the area as about things disliked. This is natural, since in most cases, it is easier to identify the things which are inconvenient or disturbing than to identify those which give a sense of well-being. Miners mentioned things they liked about living in the area only slightly more frequently than non-miners.

It is apparent that there are some significant differences between the mining and non-mining populations studied, especially in terms of income, age, education and family size. These characteristics have important implications for demands which will be made by new populations upon community services (especially schools) and housing. The differences in attitudes and perceptions of the community are more difficult to assess, and no real attempt to do so has been done here. It appears that one of the important social problems which must be addressed in situations of sudden population increases is that of alienation and

isolation of new residents; additionally, the long-time residents who see the quality of their lives deteriorating may blame the new population for the change. This is an area that should be thoroughly studied before the problems can be defined or solutions determined.

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APPENDIX A

COMPOSITE MAPPING PROCESS

PART I LIST OF PUBLISHED MAPS USED IN THE COMPOSITE
MAPPING PROCESS

PART II LEGENDS FOR THE BASE MAPS AND SUITABILITY SCALES

UNITED STATES DEPARTMENT OF AGRICULTURE

1. National Forest Planning Unit, National Forest Map, 1971
2. The Public Land Resource Inventory, 1971
3. The National Forest Inventory, 1971
4. The National Forest Inventory, 1971

UNITED STATES FOREST SERVICE

1. National Forest Inventory, 1971
2. National Forest Inventory, 1971

UNITED STATES GEOLOGICAL SURVEY

1. National Forest Inventory, 1971
2. National Forest Inventory, 1971

UNITED STATES GEOLOGICAL SURVEY

1. National Forest Inventory, 1971
2. National Forest Inventory, 1971
3. National Forest Inventory, 1971

APPENDIX A

COMPUTER MAPPING PROCESS DATA INVENTORY

PART I: GOVERNMENT MAP LISTING

The following is the listing of maps by agency used in the compilation of data for the topical and suitability maps:

Bureau of Land Management

1. Williams Fork Planning Unit Overlay Maps by Topic; 30 maps used.
2. Two Public Lands Outdoor Recreation Maps (1967 and 1971)
3. Twelve Cadastral Maps (1974). Cadastral maps denote the ownership of land, the extent and value for taxation purposes. These maps are public record.

United States Forest Service

1. White River National Forest Map (1973).
2. Routt and White River National Forest Map (1969).

Bureau of Reclamation

1. Project Maps for the Thornborough and Juniper Springs Reservoirs (1973).
2. Bureau of Reclamation Region Map (1969).

Soils Conservation Service

1. Major land resource areas of Colorado (1971).
2. Natural vegetation map of Colorado (1972).
3. General soil maps for Moffat, Routt, and Rio Blanco Counties.

United States Geological Survey

1. Topographic quadrangles of the study area at the following scales:

1:500,000

1:250,000

1: 62,500

1: 24,000

Colorado Land Use Maps

1. Existing Land Use
2. Land Ownership
3. Selected Energy Resources and Pipelines
4. Electrical Power Plants and Distribution Systems
5. Selected Mineral Lode Resources
6. Potential Available Ground Water
7. Snow Depth
8. Water Service Areas
9. Potential for Irrigated Agriculture
10. Potential for Non-irrigated Agriculture
11. Sediment Yield
12. Soil Shrink - Swell Potential

PART II: MAP LEGENDS

NOTE: The following are the legends for the topical and suitability maps. Where a precedence level is indicated, the lower the number the higher the precedence given when several of the characteristics dominate a particular one square-mile section.

Ground Water Availability

The ground water availability map was prepared by VTN from USGS topographic sheets and maps printed by the Colorado State Land Use Commission. The data represented water yield in gallons per minute (gpm).

LEGEND

Precedence and Map Symbol	Water Yield
1	over 1000 gpm
2	201-1000 gpm
3	51-200 gpm
4	11-50 gpm
5	less than 10 gpm

Water Rights by Volume

The data used for the "water rights by volume map" was part of the information contained in the Colorado State Water Rights listing. Water rights are legally established claims to existing surface water sources. These rights have associated with them a maximum volume of water that may be legally drawn from the source. However, these volume allocations may be less than the amount of water available. The water rights, listed as cubic feet per second (cfs) were totaled for each section. In the research phase it was learned that 2.65 cfs was the minimum volume capacity required for an urban center with a population of 10,000. After these surface water rights capacities were mapped, distances from any one section to the nearest section with this minimum requirement were mapped. Distance in this case is the straight line measure of how far one must travel from the section

boundary to reach a substantial water right if one does not exist in the section.

LEGEND

Precedence Level	Map Symbol	Distance
1	A	2.65 cfs or more within section
2	B	2.65 cfs or more 1 mile from section
3	C	2.65 cfs or more 2 miles from section
4	E	2.65 cfs or more 3 miles from section
5	I	2.65 cfs or more 4 miles from section
6	M	2.65 cfs or more 5 to 9 miles from section

Slope

It was difficult to determine a method for determining the average or dominant slope of a given section. A method of converting total relief within a section into slope categories was devised. This was done by subtracting the highest and lowest elevations found within a section to obtain the relative relief. The percent slope was then calculated by assuming that the relief change took place over a .5 mile distance. USGS topographic quadrangles of either a 1:62,500 or 1:24,000 scale were used to establish this map.

LEGEND

Map Symbol	Local Relief (in feet)	Slope (in percent)
A	0 - 132	0 - 5
B	133 - 264	6 - 10
C	265 - 396	11 - 15
D	397 - 528	16 - 20
E	529 - 1056	21 - 40
G	over 1056	over 40

Soils

The soils base map was prepared from SCS General Soil Maps of the Tri-County area.












Definitions are quoted directly from SCS General Soil Maps.

*Shirley Swell
inventory*

LEGEND

Map
Symbol

Soil
Association

- A  Ustorthents association: Cool, shallow and moderately deep, well-drained, moderately steep and steep soils on mesas and breaks.
- B  Ustorthents-Camborthids association: Cool, deep, well-drained, level to moderately steep soils on fans and floodplains.
- C  Haplargids-Camborthids association: Warm, deep, well-drained, nearly level and gently sloping soils on mesas and terraces.
- D  Ustorthents-Argiborolls association: Cool, deep and moderately deep, well-drained, sloping to moderately deep, well-drained, sloping to moderately steep soils on uplands.
- E  Cryoboralfs-Cryoborolls-Cryorthents association: Cold, deep to shallow, well-drained, sloping to steep soils on mountain slopes and mesas.
- H  Paleborolls-Cryoborolls association: Cool and cold, deep to shallow, well-drained, sloping to steep soils on mountain slopes.
- I  Paleborolls-Camborthids association: Cool, deep, well-drained, gently sloping to moderately steep soils on uplands.
- J  MacFarlane-Pinkham-Rock outcrop association: Cold, deep, well-drained, sloping to steep soils and Rock outcrop on mountain slopes.
- K  Cryoborolls-Haploborolls-Cryorthents association: Cold and cool, deep to shallow, well-drained, gently sloping to steep soils on benches and mountain slopes.
- L  Haybro-Camborthids association: Cool, deep and moderately deep, well-drained, gently sloping to moderately steep soils on uplands and benches.
- M  Camborthids-Argiborolls association: Cool, deep and moderately deep, well-drained, gently sloping to moderately steep soils on uplands and in valleys.

- P Cryoborolls-Cryoboralfs association: Cold, moderately deep and deep, well-drained, moderately steep and steep soils on mountain slopes.
- R Rock outcrop association: Rock outcrop and cold, very shallow and shallow, somewhat excessively drained, steep and very steep soils on mountain slopes.
- S Argiustolls-Haploborolls association: Cool dominantly moderately deep and deep, well-drained, sloping to steep soils on mountain slopes.
- T Argiborolls-Haploborolls association: Cool, dominantly deep and moderately deep, well-drained, moderately steep and steep soils on mountain slopes.
- V Fluvents association: Warm, deep, well-drained, nearly level soils on flood plains and low terraces.
- W Uslepsomments association: Cool, deep, excessively drained, gently sloping to moderately steep soils on uplands.
- X Ustifluvents-Fluvaquents association: Cool, deep, well to poorly drained, nearly level and gently sloping soils on flood plains and low terraces.
- Z Eutroboralfs-Rock outcrop-Haploborolls association: Cool, shallow and moderately deep, well-drained, steep soils and Rock outcrop on mountain slopes.

Cropland

The cropland map was compiled from data collected by aerial reconnaissance. Only two crops were found to have significant acreage to be recognizable within a section, i.e., wheat and hay.

LEGEND

Map Symbol	Crop and Percent Coverage
1	1 - 25% wheat
2	26 - 50% wheat
3	51 - 75% wheat
4	76 - 100% wheat
A	1 - 25% hay
B	26 - 50% hay
C	51 - 76% hay
D	76 - 100% hay

PERMUTATIONS

Map Symbol	Crop and Percent Coverage
J	1A
K	1B
L	1C
M	1D
N	2A
P	2B
Q	2C
S	3A
T	3B
W	4A

Surficial Geology

The surficial geology map was compiled by VTN.

LEGEND

Map Symbol	Structure
	<u>Sedimentary</u>
	<u>Quaternary</u>
A	Alluvial deposits
B	Terrace deposits
C	Glacial deposits

Tertiary

D	Browns Park formation
E	Bishop conglomerate
F	Bridger formation
G	Marrow Creek and Laney member of Green River formation
H	Green River formation
I	Cathedral Bluffs - member of Wasatch formation
J	Tipton tongue of Green River formation
K	Wasatch formation
L	Hiawatha member of Wasatch formation
M	Fort Union formation

Cretaceous

N	Lance formation
l	Lewis formation
P	Mesaverde formation
Q	Moncos shale
R	Dakota formation

Earlier

S	Jurassic-Triassic (undivided)
T	Permian-Pennsylvanian (undivided)
U	Mississippian (undivided)
V	Devonian-Cambrian (undivided)
W	Pre-Cambrian (undivided)

Igneous

X	Quaternary-Tertiary Volcanics
---	-------------------------------

Tertiary

Y	Tertiary volcanic ruffle
Z	Tertiary extrusives
2	Tertiary intrusives

Water Rights

The water rights map was extracted from the state water rights listing, depicting the type of surficial water right listed for each section.

Source: USDA-SCS General Soil Maps of Moffat, Routt and Rio Blanco Counties, Colorado, 1972 - 1:126,700

LEGEND

Map Symbol	Water Rights Type
A	Irrigation
B	Irrigation, other
C	Other
E	Irrigation, municipal, domestic
H	Stock
I	Municipal
L	Industrial, domestic
M	Industrial
O	Domestic
P	Irrigation, domestic, stock
S	Irrigation, stock
T	Municipal, domestic
V	Combination, of four or more
W	Recreation, fishery
X	Irrigation, industry, domestic
Z	Domestic, stock
2	Fishery
8	Irrigation, fishery

Water Bodies and Floodplain

This map was based on data collected in the aerial reconnaissance and superimposed with data provided by VTN and Bureau of Reclamation maps of proposed dam sites.

LEGEND

Precedence Level	Map Symbol	Category
3	C	Proposed Reservoir
2	A	Floodplain
1	B	Water bodies

Air Dispersion and Movement

This base map was prepared by VTN using estimates based on topography and monitoring data from the Yampa Project.

LEGEND

Precedence and Map Symbol	Category
5	Very poor air movement, high inversion potential, and/or downwind of existing or proposed source in area of high ground level concentration
4	Poor dispersion potential
3	Moderate dispersion potential
2	Fair dispersion potential
1	Very good dispersion potential

Predominant Land Use (Excluding Settlement and Industry)

Aerial reconnaissance data was used to create the predominant land use map. Due to the fact that the land use of an entire section was considered, the typical land use categories would have yielded a map that was all agriculture, forestry, and public land since no section has over 50 percent of its land in industry and only the sections containing Craig and Meeker are over 50 percent urban. Such broad categories would be meaningless for the analysis. Therefore, the categories were subdivided as much as possible to make the information more meaningful. The actual land use categories used are illustrated below.

LEGEND

Precedence Level	Map Symbol	Land Use
8	B	Wheat
7	D	Hay
6	I	Mixed Conifer
5	K	Aspen
4	C	Improved range
3	H	Oak scrub
2	E	Juniper
1	A	Sagebrush

Settlement and Industry

This map was produced from aerial reconnaissance data.

LEGEND

Precedence Level	Map Symbol	Category
6	1	Industry
5	2	Oil/gas extraction
4	3	Coal mining
3	5	Open pit
2	4	Urban area
1	6	Dispersed settlement (village) and farms

Land Ownership

Several sources were needed to piece together the regional pattern of land ownership. These include Bureau of Land Management, Cadastral Maps, U. S. Forest Service district maps, a Land Use Commission topical map, and VTN information.

LEGEND

Precedence Level	Map Symbol	Ownership Type
9	5	National parks
8	4	National forest
7	1	Power site
6	2	Power site withdrawal
5	3	Reclamation withdrawal
4	8	BLM lands
3	7	State land
2	6	Miscellaneous ¹
1	9	Private land

¹BLM category for unspecified land ownership

Transportation

County road maps and information provided by VTN were used to prepare the transportation map. The emphasis here is on site accessibility.

LEGEND

Precedence Level	Map Symbol	Transportation Type
8	S	Airport
7	P	Proposed Rail line
6	A	Railroad and paved highway
5	B	Railroad
4	C	Paved highway
3	E	Secondary highway
2	I	Gravel road
1	V	Trail

Vegetation

Aerial reconnaissance data attained from August 12, 1974 to August 17, 1974 was used to produce this base map.

LEGEND

Precedence Level	Map Symbol	Vegetation Type
6	I	Mixed Conifer
5	K	Aspen
4	H	Oak scrub
3	E	Juniper
2	C	Improved range
1	A	Sagebrush

Minerals

The minerals base map was prepared by overlaying and coordinating Bureau of Land Management district maps and Land Use Commission topical maps.

LEGEND

Precedence Level	Map Symbol	Mineral Potential
10	A	Coal, priority 1
9	B	Coal, priority 2
8	C	Oil and gas, priority 1
7	X	Oil shale
6	E	Coal, priority 3
5	H	Oil and gas, priority 2
4	I	Coal, priority 4
3	V	Geothermal
2	R	Gold
1	S	Uranium

Wildlife

This base map was composited from four maps developed by VTN: avian biology, aquatic biology, big game, and small game. Data on these maps were in the form of ratings by section which reflected the scale of impact by urban development, with 1 as the least amount of adverse impact and 5 as the greatest amount. The weights per section were totaled to create the composite values.

LEGEND

Map Symbol	Composite Value	
V	20	Greatest Impacts
S	19	
P	18	
N	17	
K	16	
I	15	
E	14	
D	13	
C	12	
B	11	
A	10	Smallest Impacts

APPENDIX B

SPECIES LIST

APPENDIX B

SPECIES LIST

The following are lists of the plants and animals observed or expected to occur within the region. The sources of these lists are field surveys by VTN biologists, published and unpublished species lists of the general area and consultation with local officials. These lists are not intended to be exhaustive, but are meant to give a clear understanding of the nature and diversity of the biological resources of the area.

Vegetation

Trees

Narrowleaf Cottonwood	<u>Populus angus ifolia</u>
Utah juniper	<u>Juniperus osteosperma</u>
Pinyon Pine	<u>Pinus edulis</u>
Douglas fir	<u>Pseudotsuga menziesii</u>
Subalpine fir	<u>Abies lasiocarpa</u>
Engelmann spruce	<u>Picea engelmannii</u>
Willow	<u>Salix spp.</u>
Aspen	<u>Populus tremuloides</u>
Lodgepole pine	<u>Pinus contorta</u>

Shrubs

Utah serviceberry	<u>Amelanchier utahensis</u>
Gambel (scrub) oak	<u>Quercus gambelii</u>
snowberry	<u>Symphoricarpos oreophilus</u>
willow	<u>Salix sp.</u>
big sagebrush	<u>Artemisia tridentata</u>
Oregon grape	<u>Berberis repens</u>
wild rose	<u>Rosa woodsii</u>
Greasewood	<u>Sarcobatus vermiculatus</u>
Big Rabbitbrush	<u>Chrysothamnus nauseosus</u>
Buffaloberry	<u>Shepherdia canadensis</u>
Blueberry	<u>Vaccinium sp.</u>
Bitter brush	<u>Purshia tridentata</u>

Herbs and Grasses

violet	<u>Viola purpurea</u>
buttercup	<u>Ranunculus glaberrimus</u>
American bluebells	<u>Mertensia lanceolata</u>
Rocky Mountain loco	<u>Oxytropis sericea</u>
paintbrush	<u>Castilleja integra</u>
groundsel	<u>Senecio eremophilus</u>
yarrow	<u>Achillea lanulosa</u>
false yarrow	<u>Chaenactis sp.</u>
clover	<u>Trifolium sp.</u>
lupine	<u>Lupinus sp.</u>
death camas	<u>Zigadenus sp.</u>
Wild onion	<u>Allium sp.</u>
blue-eyed mary	<u>Collinsia sp.</u>
phlox	<u>Phlox sp.</u>
cattail	<u>Typha latifolia</u>
Sweet Clover	<u>Melelotus officinalis</u>
Russian Thistle	<u>Salsola kali</u>
Globe Mallow	<u>Sphaeralcea coccinea</u>
Gilia	<u>Gilia aggregata</u>
sedge	<u>Carex sp.</u>
rush	<u>Juncus sp.</u>
Indian ricegrass	<u>Oryzopsis hymenoides</u>
wild rye	<u>Elymus cinereus</u>
six weeks fescue	<u>Festuca octoflora</u>
prickly pear	<u>Opuntia polyacantha</u>
Bromegrass	<u>Bromus tectorum</u>
Needle and Thread Grass	<u>Stipa comata</u>

Wildlife

Mammals

elk	<u>Cervis canadensis</u>
mule deer	<u>Odocoileus hemionus</u>
coyote	<u>Canis latrans</u>
Yellowbelly marmot	<u>Marmota flaviventris</u>
golden-mantled squirrel	<u>Spermophilus lateralis</u>
northern pocket gopher	<u>Thomomys talpoides</u>
blacktail jackrabbit	<u>Lepus californicus</u>
desert cottontail	<u>Sylvilagus auduboni</u>
bobcat	<u>Lynx rufus</u>
striped skunk	<u>Mephitis mephitis</u>
rock squirrel	<u>Spermophilus variegatus</u>

long-tailed weasel
long-tailed vole
deer mouse
least chipmunk
Ord's kangaroo rat

Mustela frenata
Microtus longicaudus
Peromyscus maniculatus
Eutamias minimus
Dipodomys ordii

Birds

turkey vulture
red-tailed hawk
rough-legged hawk
marsh hawk
sparrow hawk
golden eagle
bald eagle
great horned owl
barn owl
black-billed magpie
mallard
common raven
common crow
rufous-sided towhee
green-tailed towhee
robin
chipping sparrow
Oregon junco
mourning dove
western meadowlark
red-winged blackbird
horned lark
mountain bluebird
sage grouse
sharp-tailed grouse
chuckar
black-chinned hummingbird
snow bunting

Cathartes aura
Buteo jamaicensis
Buteo lagopus
Circus cyaneus
Falco sparverius
Aquila chrysaetos
Haliaeetus leucocephalus
Bubo virginianus
Tyto alba
Pica pica
Anas platy rhynchos
Corvus corax
Corvus brachyrhynchos
Pipilo erythrophthalmus
Chlorura chlorura
Turdus migratorius
Spizella passerina
Junco oreganus
Zenaidura macroura
Sturnella neglecta
Agelaius phoeniceus
Eremophila alpestris
Sialia currucoides
Centrocercus urophasianus
Pediocetes phasianellus
Alectoris graeca
Archilochus alexandri
Plectrophenax nivalis

Reptiles and Amphibians

eastern fence lizard
sagebrush lizard
tree lizard
side-blotched lizard
collared lizard
plateau whiptail
short-horned lizard
western garter snake

Sceloporus undulatus
Sceloporus graciosus
Urosaurus ornatus
Uta stansburiana
Crotaphytus collaris
Cnemidophorus velox
Phrynosoma douglassi
Thamnophis elegans

gopher snake
racer
western rattlesnake
woodhouse's toad
Great Basin spadefoot
tiger salamander

Pituophis melanoleucus
Coluber constrictor
Crotalus viridis
Bufo woodhousei
Scaphiopus intermontanus
Ambystoma tigrinum

APPENDIX C

FEDERAL, STATE AND COUNTY REGULATIONS

ARCHAEOLOGICAL REGULATIONS

PART I REGIONAL ANALYSIS FROM THE STATE HISTORICAL SOCIETY OF COLORADO

PART II REPORT FROM UNIVERSITY OF COLORADO MUSEUM

PART III NAMES OF APPLICABLE PERSONS FOR THE CONDUCT OF SITE INVESTIGATIONS

PART IV STATE LEGISLATION

THE STATE HISTORICAL SOCIETY OF COLORADO

Colorado State Museum, 200 Fourteenth Avenue, Denver 80203

Office of the State Archaeologist
Ketchum 5
University of Colorado
Boulder, Colorado 80302
11 September 1974

Mr. E. A. Jackson, Jr.
Antiquities Coordinator
Environmental Sciences
VTN
6875 E. Evans Avenue
Denver, Colorado 80222

Dear Mr. Jackson:

Enclosed is the information you requested September 5, 1974 on archaeological resources recorded in the Office of the State Archaeologist for those areas of Moffat, Routt and Rio Blanco counties as indicated on your map. This area lies within T1S north to T9N and R86W west through R96W. This information is to be used for an inventory of cultural and natural history resources in a land-use study area.

Twenty five archaeological sites are recorded within the above area in the present files of this office. Seventeen fall within Moffat County and eight belong to Routt County. Brief summaries of the site information are included as the last part of this letter. More detailed data may be obtained if it is needed.

As we have discussed, there are other sources of information which should be checked out. Dr. Cal Jennings and Dr. Elizabeth Morris, both of the Anthropology Department, Colorado State University, Fort Collins, Colorado, have worked recently in the northwestern portion of the state. In addition, other agencies concerned with your area, such as the Forest Service, BLM, etc., have records of archaeological materials in their holdings. Also, local people and societies sometimes have information which is not available in central records.

Because it is pertinent to your statement on archaeological resources, it must be added that it is important to realize the nature of this survey file at this time. The Office of State Archaeologist is building a master file on Colorado site information. It is being expanded to hopefully include site data from all agencies and institutions dealing with prehistoric Colorado materials, but this is far from being accomplished. For the above file search I did search the pertinent University of Denver site records of which we have copies. At this time our records are not comprehensive and this information does not even represent a full literature search on the area of concern.

11 September 11, 1974

Another important point is that this file holds records only of reported sites, sites referred to this office and previously to the University of Colorado Museum. Most areas of the state have not been systematically surveyed for prehistoric materials. To my knowledge, the area of your concern has had only a small percentage of the acreage covered in any systematic way. From the information at hand to me at this time I would estimate the coverage by systematic work at less than 1%. I am not aware of extensive Forest Service or BLM activity archaeologically in the area, but this might change the estimate. With such little activity in an area, a few reported sites does not necessarily mean that there is only a little archaeological material in an area, only that there has been little reporting of such items. For this reason, the information in the files is a start, but it is basically an inadequate assesment of such resources. Any really significant evaluation of archaeological resources has to be the result of a qualified person actually walking the area. Even then surface indications are often insufficient for locating potentially important sites. Some hidden cultural materials may only be revealed during the process of land alteration, trenching, levelling, arroyo cutting, etc. My primary concern is that these files might be mistaken to be a complete statement of such resources for they certainly are not. Of course, projects differ in their impact and their need for detailed information.

I have marked the enclosed site records "For Land Use Planning Only", and * in this sense it is restricted information. We are anxious to cooperate with projects involved with impact statement, land use planning, inventories, etc. However, unfortunately we are concerned that such detailed site locations not become a guide for irresponsible purposes. Irreparable archaeological damage could be done if this information led to the surface denudation or digging of site by unauthorized parties. We trust you will appreciate the potential difficulties we face and will responsibly limit the circulation of the enclosed specific site information.

As you already know, this office deals only with archaeological materials. For information regarding historical sites in the area, I would suggest you contact Cynthia Emrick, Preservation Assistant, State Historical Society, 1880 Gaylord, Denver, Colorado (telephone 333-1672).

Thank you for your cooperation. Your contribution regarding Moffat County sites is greatly appreciated.

Sincerely,

Hannah Huse

Hannah Huse
Survey Archaeologist

* These records were deleted from this report by VTN because of their confidentiality.

THE STATE HISTORICAL SOCIETY OF COLORADO

Colorado State Museum, 200 Fourteenth Avenue, Denver 80203

September 16, 1974

SEP 23 1974

Mr. E. A. Jackson, Jr.
Antiquities Coordinator
VTN
Engineers Architects Planners
6875 Evans Avenue
Denver, Colorado 80222

RE: Job Number 1395-8

Dear Mr. Jackson:

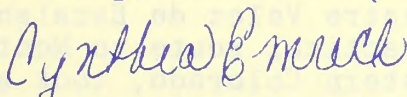
We are sending the map and information you requested in your letter of September 6, 1974 and your telephone call on the 12th in reference to Job Number 1395-8.

We have marked the map with the little we have listed with the National Register and our state Inventory and are including short descriptions of their historical significance. Dr. Hester will be sending a map with the archaeological and paleontological data. We also would like you to get in touch with our area contact, R. G. Lytle in Meeker, if needed.

The Dominguez-Escalante Trail came up through Rio Blanco county in the area of Spring and Douglas Creeks of the White River. We bring it to your attention because it is a special four-state bi-centennial project. Since our Inventory is so scant in this area we would appreciate it if you would keep your eyes open and thus keep us informed as to your findings and project.

Thank you for your cooperation.

Sincerely,



Cynthia Emrick
Preservation Assistant

enclosure:

Military Camp on the White River
Meeker
Rio Blanco County
1879-present

This military camp was established on the site of present-day Meeker shortly after the nearby Meeker Massacre in 1879. The military reservation was eight miles square. It was a large and well-ordered camp, and for a short while, "several hundred" soldiers were stationed there. By 1883 the camp's usefulness was over since the Ute Indians had been removed to Utah. The buildings in the camp were sold at auction in late 1883, and many of them were used to start the new town of Meeker. Four of the original buildings remain in their original positions behind the court house. They were part of the officer's quarters.

Thornburgh Battle Site
Twenty miles northeast of the White River Indian Agency in the valley of Milk Creek.
Rio Blanco County
1879

On September 24, 1879, Major T. T. Thornburgh, leading an advance body of troops from Fort Steele, Wyo., heading for the White River Indian Agency, was set upon by about 300 Utes. Thornburgh and several of his men were killed immediately. The main body of the troops fought an eleven day battle. The Indians left on October 5 when additional troops arrived from Fort Russell, Wyo. Thornburgh and thirteen soldiers were killed; nearly forty were wounded, about half the original number. About twice as many Indians were killed or wounded.

Dominguez-Escalante Expedition
Rio Blanco County--also La Plata, Montezuma, Dolores, San Miguel, Montrose, Mesa, Delta, Garfield and Moffat counties.

1776

In 1776 Spanish missionary-explorers Fray Francisco Antanasio Dominguez and Fray Silveatre Velez de Escalante set out from Santa Fe to find a practical route to Monterey, California. They entered southwestern Colorado, took a wandering route northward, and left Colorado in the vicinity of Dinosaur National Monument. They never reached their destination, but they did add greatly to Spanish knowledge of western Colorado, explored more unknown land than did Lewis and Clark, and set a new standard for friendly

Dominguez-Escalante Expedition continued-
relations with the Indians.

Denver and Rio Grande Railway Various routes 1870-present

The Denver and Rio Grande Railway was the predecessor company of today's Denver and Rio Grande Western Railroad. It was founded in 1870 by William Jackson Palmer who pushed the line south to the coal fields of the Pueblo, Canon City, Walsenburg, and Trinidad areas. The Denver and Rio Grande Railway was the first major narrow gauge (three foot) line in the country, and its example resulted in extensive narrow gauge construction in mountainous regions of the United States. The D. & R.G. was the first line to penetrate across the Colorado mountains and it was a major economic force in opening up much of Colorado to rapid settlement in the 1870s and 1880s. Literally dozens of towns owe their existence to the Denver and Rio Grande. These towns still retain their Victorian structures and charm. Many changes in routes have taken place but the railway has emerged as a major modern rail system.

UNIVERSITY OF COLORADO MUSEUM

BOULDER, COLORADO 80302

13 September 1974

Mr. E. A. Jackson, Jr.
Antiquities Coordinator
Environmental Sciences
VTN Colorado, Inc.
6875 East Evans Ave.
Denver, CO 80222

RECEIVED OCT 1 6 1974

Dear Mr. Jackson:

In response to your letter of September 9th, I have the following comments to make on the area of Northwestern Colorado outlined on the map which you gave me. Before I begin specific comments, I would like to add that all areas which I will mention should be considered as potential fossil bearing areas and should any decision be made in the future to develop these areas for one reason or another, the areas should be prospected by people walking on the ground and if construction takes place, a trained person should be present during the process of construction should fossil bones be found.

The main geological formations which should be considered as potentially vertebrate fossil bearing are, in order of age from oldest to youngest: the Paleocene Fort Union Formation, the Eocene Wasatch Formation, the Eocene Green River Formation and the Miocene Browns Park Formation. The Fort Union Formation has not produced any fossils in its outcrop area within your map. This outcrop area is a very thin band stretching east and west north of the town of Craig. However, north of the Colorado line in Dad, Wyoming, a productive locality currently being worked by the American Museum of Natural History exists. This locality is producing an extensive and important fauna.

The Wasatch Formation occurs west of the highway from Rifle to Craig, particularly at the base of the Green River Escarpment in the White River Valley, in the Danforth Hills on Colorow Mountain. The formation also outcrops in the northwestern part of the area beginning several miles north of U.S. 40 to the northern limit and west of the highway from Craig to Baggs. Some outcrops are also present east of the highway. An important fauna from the Wasatch Formation north of the area enclosed in your boundary has been recently described by McKenna.

The Green River Formation outcrops in the southwestern part of the area from Colorow Mountain southward and west of the highway from Rifle to Meeker and west of the road from Meeker north to Maybell. In Wyoming the Green River Formation is an important fossil fish bearing deposit. Fossil fish are rare in the Green River Formation of Colorado but fossil insects and fossil plants are quite common. A recent monograph on the fossil plants has been published by MacGinitie. Publications on the fossil insects are quite old, most of them having been written by Scudder before 1900.

Mr. E. A. Jackson, Jr.

13 September 1974

Page two

The Browns Park Formation occurs in the Yampa River Valley and surrounding hills from approximately six miles west of Craig to the western border of your map. The formation has produced a few fossils, the last of which were described by Peterson in 1928 but recent finds by the U.S. Geological Survey in road cuts along U.S. 40 indicate that the formation is still bearing fossils. Scattered outcrops of the Browns Park Formation are found south of U.S. 40.

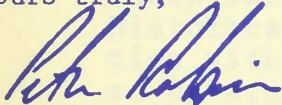
In the southeastern portion of your map area numerous exposures of volcanic rocks occur in the Dunkley Flatops and similar areas in the White River National Forest. Sedimentary units intercalated within these volcanics have from time to time produced fossil bones of late Miocene age although no productive localities are known within the area outlined in your map. They have been found on Derby Mountain and W Mountain in the Trappers Lake Area. A white sandstone unit occurring below the basalts has produced one fossil vertebrate near the town of Yampa, Colorado. The formational unit which is intercalated with the basalts which has been called Browns Park Formation by some authors and North Park Formation by others does occur in the northwestern part of the area and at places like Shield Mountain north of Steamboat Springs has produced fossil vertebrates.

In the area immediately north and northeast of Craig, the late Cretaceous Lance Formation occurs. This formation has produced a significant flora in Southern Wyoming. Further to the northeast near Lance Creek, Wyoming, it has produced dinosaurs and fossil mammals. Good exposures of this formation should be prospected.

Many square miles of the area underlain by the formations noted on the map are grass covered and essentially sterile as far as surface prospecting is concerned. Intensive surface prospecting should be considered only for those areas where bare rock is exposed. On the other hand, if development is considered for some of the areas which are underneath grass and obscured from the surface, it is worth considering the necessity of having someone on hand when excavation or similar changing of the landscape takes place.

The information which I have for you took approximately three hours to accumulate. Would you please make the check payable to the University of Colorado Foundation, Inc., % the University of Colorado Museum in the amount of \$75.00.

Yours truly,



Peter Robinson
Director

PR:lb

Enc. 3

REFERENCES

Wasatch Formation

McKenna, Malcolm C., 1960, Fossil Mammalia from the early Wasatchian Four Mile Fauna, Eocene of Northwest Colorado. Univ. Calif. Publ. Geol. Sci. V. 37 pp. 1-130.

Green River Formation

MacGinitie, H. D., 1969, The Eocene Green River Flora of Northwestern Colorado and Northeastern Utah. Univ. Calif. Publ. Geol. Sci. V. 83.

Browns Park Formation

Peterson, O. A., 1928, The Browns Park Formation. Mem. Carnegie Mus. v. 11 no. 2 pp. 87-124.

Sears, Julian D., 1924, Geology and Oil and Gas Prospects of part of Moffat County, Colorado and Southern Sweetwater County, Wyoming. U.S. Geol. Surv. Bull. 751 G.

The following persons and/or agencies should be contacted if further antiquities information is required.

Historical Resources:

Stephen H. Hart
Historical Preservation Officer

Cynthia Emrick
Preservation Assistant

Colorado State Historical Society
200 Fourteenth Avenue
Denver, Colorado 80203
(303) 333-1672

Archaeological Resources:

Dr. James J. Hester
State Archaeologist

Hannah Huse
Assistant State Archaeologist

Office of the State Archaeologist
Ketchum 5A
University of Colorado
Boulder, Colorado 80302
(303) 492-7419

Paleontological Resources:

Peter Robinson
Museum Director
University of Colorado
Boulder, Colorado 80302
(303) 492-6165

No information is provided on fees for the above services. These will vary with the size and scope of the project (s). Historical resource inventories may be performed in conjunction with archaeological inventories. Field methods employed by archaeological field teams enable them to identify and locate historical resources; however, few archaeologists are able to perform paleontological resources inventories and vice-versa.

An Act

HOUSE BILL NO. 1041. BY REPRESENTATIVES Dittemore, Buechner, Herzberger, Miller, Pettie, Eaker, Eckelberry, Friedman, Gustafson, Hamlin, Koster, O'Brian, Ross, Sack, Sonnenberg, and Tempest; also SENATORS Allshouse, Darby, Johnson, Plock, H. Brown, DeBerard, L. Fowler, Garnsey, Jackson, Klein, McCormick, Schieffelin, Stockton, and Strickland.

CONCERNING LAND USE, AND PROVIDING FOR IDENTIFICATION, DESIGNATION, AND ADMINISTRATION OF AREAS AND ACTIVITIES OF STATE INTEREST, AND ASSIGNING ADDITIONAL DUTIES TO THE COLORADO LAND USE COMMISSION AND THE DEPARTMENT OF LOCAL AFFAIRS, AND MAKING APPROPRIATIONS THEREFOR.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. Chapter 106, Colorado Revised Statutes 1963, as amended, is amended BY THE ADDITION OF A NEW ARTICLE to read:

ARTICLE 7

Areas and Activities of State Interest

PART 1

GENERAL PROVISIONS

106-7-101. Legislative declaration. (1) In addition to the legislative declaration contained in section 106-4-1 (1), the general assembly further finds and declares that:

(a) The protection of the utility, value, and future of all lands within the state, including the public domain as well as privately owned land, is a matter of the public interest;

Capital letters indicate new material added to existing statutes; dashes through words indicate deletions from existing statutes and such material not part of act.

(b) Adequate information on land use and systematic methods of definition, classification, and utilization thereof are either lacking or not readily available to land use decision makers;

(c) It is the intent of the general assembly that land use, land use planning, and quality of development are matters in which the state has responsibility for the health, welfare, and safety of the people of the state and for the protection of the environment of the state.

(2) It is the purpose of this article that:

(a) The general assembly shall describe areas which may be of state interest and activities which may be of state interest and establish criteria for the administration of such areas and activities;

(b) Local governments shall be encouraged to designate areas and activities of state interest and, after such designation, shall administer such areas and activities of state interest and promulgate guidelines for the administration thereof; and

(c) Appropriate state agencies shall assist local governments to identify, designate, and adopt guidelines for administration of matters of state interest.

106-7-102. General definitions. As used in this article, unless the context otherwise requires:

(1) "Development" means any construction or activity which changes the basic character or the use of the land on which the construction or activity occurs.

(2) "Local government" means a municipality or county.

(3) "Local permit authority" means the governing body of a local government with which an application for development in an area of state interest or for conduct of an activity of state interest must be filed or the designee thereof.

(4) "Matter of state interest" means an area of state interest or an activity of state interest or both.

(5) "Municipality" means a home rule or statutory city, town, or city and county or a territorial charter city.

(6) "Person" means any individual, partnership, corporation, association, company, or other public or corporate body, including the federal government, and includes any political subdivision, agency, instrumentality, or corporation of the state.

106-7-103. Definitions pertaining to natural hazards. As

used in this article, unless the context otherwise requires:

(1) "Aspect" means the cardinal direction the land surface faces, characterized by north-facing slopes generally having heavier vegetation cover.

(2) "Avalanche" means a mass of snow or ice and other material which may become incorporated therein as such mass moves rapidly down a mountain slope.

(3) "Corrosive soil" means soil which contains soluble salts which may produce serious detrimental effects in concrete, metal, or other substances that are in contact with such soil.

(4) "Debris-fan floodplain" means a floodplain which is located at the mouth of a mountain valley tributary stream as such stream enters the valley floor.

(5) "Dry wash channel and dry wash floodplain" means a small watershed with a very high percentage of runoff after torrential rainfall.

(6) "Expansive soil and rock" means soil and rock which contains clay and which expands to a significant degree upon wetting and shrinks upon drying.

(7) "Floodplain" means an area adjacent to a stream, which area is subject to flooding as the result of the occurrence of an intermediate regional flood and which area thus is so adverse to past, current, or foreseeable construction or land use as to constitute a significant hazard to public health and safety or to property. The term includes but is not limited to:

(a) Mainstream floodplains;

(b) Debris-fan floodplains; and

(c) Dry wash channels and dry wash floodplains.

(8) "Geologic hazard" means a geologic phenomenon which is so adverse to past, current, or foreseeable construction or land use as to constitute a significant hazard to public health and safety or to property. The term includes but is not limited to:

(a) Avalanches, landslides, rock falls, mudflows, and unstable or potentially unstable slopes;

(b) Seismic effects;

(c) Radioactivity; and

(d) Ground subsidence.

(9) "Geologic hazard area" means an area which contains or is directly affected by a geologic hazard.

(10) "Ground subsidence" means a process characterized by the downward displacement of surface material caused by natural phenomena such as removal of underground fluids, natural consolidation, or dissolution of underground minerals or by man-made phenomena such as underground mining.

(11) "Mainstream floodplain" means an area adjacent to a perennial stream that is subject to periodic flooding.

(12) "Mudflow" means the downward movement of mud in a mountain watershed because of peculiar characteristics of extremely high sediment yield and occasional high runoff.

(13) "Natural hazard" means a geologic hazard, a wildfire hazard, or a flood.

(14) "Natural hazard area" means an area containing or directly affected by a natural hazard.

(15) "Radioactivity" means a condition related to various types of radiation emitted by natural radioactive minerals that occur in natural deposits of rock, soil, and water.

(16) "Seismic effects" means direct and indirect effects caused by an earthquake or an underground nuclear detonation.

(17) "Siltation" means a process which results in an excessive rate of removal of soil and rock materials from one location and rapid deposit thereof in adjacent areas.

(18) "Slope" means the gradient of the ground surface which is definable by degree or percent.

(19) "Unstable or potentially unstable slope" means an area susceptible to a landslide, a mudflow, a rock fall, or accelerated creep of slope-forming materials.

(20) "Wildfire behavior" means the predictable action of a wildfire under given conditions of slope, aspect, and weather.

(21) "Wildfire hazard" means a wildfire phenomenon which is so adverse to past, current, or foreseeable construction or land use as to constitute a significant hazard to public health and safety or to property. The term includes but is not limited to:

- (a) Slope and aspect;
- (b) Wildfire behavior characteristics; and
- (c) Existing vegetation types.

(22) "Wildfire hazard area" means an area containing or directly affected by a wildfire hazard.

106-7-104. Definitions pertaining to other areas and activities of state interest. As used in this article, unless the context otherwise requires:

(1) "Airport" means any municipal or county airport or airport under the jurisdiction of an airport authority.

(2) "Area around a key facility" means an area immediately and directly affected by a key facility.

(3) "Arterial highway" means any limited-access highway which is part of the federal-aid interstate system or any limited-access highway constructed under the supervision of the state department of highways.

(4) "Collector highway" means a major thoroughfare serving as a corridor or link between municipalities, unincorporated population centers or recreation areas, or industrial centers and constructed under guidelines and standards established by, or under the supervision of, the state department of highways. Collector highway does not include a city street or local service road or a county road designed for local service and constructed under the supervision of local government.

(5) "Domestic water and sewage treatment system" means a wastewater treatment plant, water treatment plant, or water supply system, as defined in section 66-38-2 (6), (7), and (8), C.R.S. 1963, and any system of pipes, structures, and facilities through which wastewater is collected for treatment.

(6) "Historical or archaeological resources of statewide importance" means resources which have been officially included in the national register of historic places, designated by statute, or included in an established list of places compiled by the state historical society.

(7) "Key facilities" means:

(a) Airports;

(b) Major facilities of a public utility;

(c) Interchanges involving arterial highways;

(d) Rapid or mass transit terminals, stations, and fixed guideways.

(8) "Major facilities of a public utility" means:

(a) Central office buildings of telephone utilities;

(b) Transmission lines, power plants, and substations of electrical utilities; and

(c) Pipelines and storage areas of utilities providing natural gas or other petroleum derivatives.

(9) "Mass transit" means a coordinated system of transit modes providing transportation for use by the general public.

(10) "Mineral" means an inanimate constituent of the earth, in either solid, liquid, or gaseous state which, when extracted from the earth, is usable in its natural form or is capable of conversion into usable form as a metal, a metallic compound, a chemical, an energy source, a raw material for manufacturing, or construction material. This definition does not include surface or ground water subject to appropriation for domestic, agricultural, or industrial purposes, nor does it include geothermal resources.

(11) "Mineral resource area" means an area in which minerals are located in sufficient concentration in veins, deposits, bodies, beds, seams, fields, pools, or otherwise, as to be capable of economic recovery. The term includes but is not limited to any area in which there has been significant mining activity in the past, there is significant mining activity in the present, mining development is planned or in progress, or mineral rights are held by mineral patent or valid mining claim with the intention of mining.

(12) "Natural resources of statewide importance" is limited to shorelands of major publicly-owned reservoirs and significant wildlife habitats in which the wildlife species, as identified by the division of wildlife of the department of natural resources, in a proposed area could be endangered.

(13) "New communities" means the major revitalization of existing municipalities or the establishment of urbanized growth centers in unincorporated areas.

(14) "Rapid transit" means the element of a mass transit system involving a mechanical conveyance on an exclusive lane or guideway constructed solely for that purpose.

106-7-105. Effect of article - public utilities. (1) With regard to public utilities, nothing in this article shall be construed as enhancing or diminishing the power and authority of municipalities, counties, or the public utilities commission. Any order, rule, or directive issued by any governmental agency pursuant to this article shall not be inconsistent with or in contravention of any decision, order, or finding of the public utilities commission with respect to public convenience and necessity. The public utilities commission and public utilities shall take into consideration and, when feasible, foster

compliance with adopted land use master plans of local governments, regions, and the state.

(2) Nothing in this article shall be construed as enhancing or diminishing the rights and procedures with respect to the power of a public utility to acquire property and rights-of-way by eminent domain to serve public need in the most economical and expedient manner.

106-7-106. Effect of article - rights of property owners - water rights. (1) Nothing in this article shall be construed as:

(a) Enhancing or diminishing the rights of owners of property as provided by the state constitution or the constitution of the United States;

(b) Modifying or amending existing laws or court decrees with respect to the determination and administration of water rights.

106-7-107. Effect of article - developments in areas of state interest and activities of state interest meeting certain conditions. (1) This article shall not apply to any development in an area of state interest or any activity of state interest which meets any one of the following conditions as of the effective date of this article:

(a) The development or activity is covered by a current building permit issued by the appropriate local government; or

(b) The development or activity has been approved by the electorate; or

(c) The development or activity is to be on land:

(I) Which has been conditionally or finally approved by the appropriate local government for planned unit development or for a use substantially the same as planned unit development; or

(II) Which has been zoned by the appropriate local government for the use contemplated by such development or activity; or

(III) With respect to which a development plan has been conditionally or finally approved by the appropriate governmental authority.

106-7-108. Effect of article - state agency or commission responses. (1) Whenever any person desiring to carry out development as defined in section 106-7-102 (1) is required to obtain a permit, to be issued by any state agency or commission for the purpose of authorizing or allowing such development,

pursuant to this or any other statute or regulation promulgated thereunder, such agency shall establish a reasonable time period, which shall not exceed sixty days following receipt of such permit application, within which such agency must respond in writing to the applicant, granting or denying said permit or specifying all reasonable additional information necessary for the agency or commission to respond. If additional information is required, said agency or commission shall set a reasonable time period for response following the receipt of such information.

(2) Whenever a state agency or commission denies a permit, the denial must specify:

(a) The regulations, guidelines, and criteria or standards used in evaluating the application;

(b) The reasons for denial and the regulations, guidelines, and criteria or standards the application fails to satisfy; and

(c) The action that the applicant would have to take to satisfy the state agency's or commission's permit requirements.

(3) Whenever an application for a permit as provided under this section contains a statement describing the proposed nature, uses, and activities in conceptual terms for the development intended to be accomplished and is not accompanied with all additional information, including, without limitation, engineering studies, detailed plans and specifications, zoning approval, or where a hearing is required by the statutes, regulations, rules, ordinances, or resolutions thereof prior to the issuance of the requested permit, the agency or commission shall, within the time provided in this section for response, indicate its acceptance or denial of the permit on the basis of the concept expressed in the statement of the proposed uses and activities contained in the application. Such conceptual approval shall be made subject to the applicant filing and completing all prerequisite detailed additional information in accordance with the usual filing requirements of the agency or commission within a reasonable period of time.

(4) All agencies or commissions authorized or required to issue permits for development shall adopt rules and regulations, or amend existing rules and regulations, so as to require that such agency or commission respond in the time and manner required in this section.

(5) Nothing in this section shall shorten the time allowed for responses provided by federal statute dealing with, or having a hearing on, the subject of any such application for permit.

(6) The provisions of this section shall not apply to applications approved, denied, or processed by a unit of local

government.

PART 2

AREAS AND ACTIVITIES DESCRIBED -

CRITERIA FOR ADMINISTRATION

106-7-201. Areas of state interest - as determined by local governments. (1) Subject to the procedures set forth in part 4 of this article, a local government may designate certain areas of state interest from among the following:

- (a) Mineral resource areas;
- (b) Natural hazard areas;
- (c) Areas containing, or having a significant impact upon, historical, natural, or archaeological resources of statewide importance; and
- (d) Areas around key facilities in which development may have a material effect upon the facility or the surrounding community.

106-7-202. Criteria for administration of areas of state interest. (1) (a) Mineral resource areas designated as areas of state interest shall be protected and administered in such a manner as to permit the extraction and exploration of minerals therefrom, unless extraction and exploration would cause significant danger to public health and safety. If the local government having jurisdiction, after weighing sufficient technical or other evidence, finds that the economic value of the minerals present therein is less than the value of another existing or requested use, such other use should be given preference; however, other uses which would not interfere with the extraction and exploration of minerals may be permitted in such areas of state interest.

(b) Areas containing only sand, gravel, quarry aggregate, or limestone used for construction purposes shall be administered as provided by article 36 of chapter 92, C.R.S. 1963.

(c) The extraction and exploration of minerals from any area shall be accomplished in a manner which causes the least practicable environmental disturbance, and surface areas disturbed thereby shall be reclaimed in accordance with the provisions of article 13 or article 32 of chapter 92, C.R.S. 1963, whichever is applicable.

(d) Unless an activity of state interest has been designated or identified or unless it includes part or all of another area of state interest, an area of oil and gas or

geothermal resource development shall not be designated as an area of state interest unless the state oil and gas conservation commission identifies such area for designation.

(2) (a) Natural hazard areas shall be administered as follows:

(I) Floodplains shall be administered so as to minimize significant hazards to public health and safety or to property. The Colorado water conservation board shall promulgate a model floodplain regulation no later than September 30, 1974. Open space activities such as agriculture, recreation, and mineral extraction shall be encouraged in the floodplains. Any combination of these activities shall be conducted in a mutually compatible manner. Building of structures in the floodplain shall be designed in terms of the availability of flood protection devices, proposed intensity of use, effects on the acceleration of floodwaters, potential significant hazards to public health and safety or to property, and other impact of such development on downstream communities such as the creation of obstructions during floods. Activities shall be discouraged which, in time of flooding, would create significant hazards to public health and safety or to property. Shallow wells, solid waste disposal sites, and septic tanks and sewage disposal systems shall be protected from inundation by floodwaters. Unless an activity of state interest is to be conducted therein, an area of corrosive soil, expansive soil and rock, or siltation shall not be designated as an area of state interest unless the Colorado soil conservation board, through the local soil conservation district, identifies such area for designation.

(II) Wildfire hazard areas in which residential activity is to take place shall be administered so as to minimize significant hazards to public health and safety or to property. The Colorado state forest service shall promulgate a model wildfire hazard area control regulation no later than September 30, 1974. If development is to take place, roads shall be adequate for service by fire trucks and other safety equipment. Firebreaks and other means of reducing conditions conducive to fire shall be required for wildfire hazard areas in which development is authorized.

(III) In geologic hazard areas all developments shall be engineered and administered in a manner that will minimize significant hazards to public health and safety or to property due to a geologic hazard. The Colorado geological survey shall promulgate a model geologic hazard area control regulation no later than September 30, 1974.

(b) After promulgation of guidelines for land use in natural hazard areas by the Colorado water conservation board, the Colorado soil conservation board through the soil conservation districts, the Colorado state forest service, and the Colorado geological survey, natural hazard areas shall be

administered by local government in a manner which is consistent with the guidelines for land use in each of the natural hazard areas.

(3) Areas containing, or having a significant impact upon, historical, natural, or archaeological resources of statewide importance, as determined by the state historical society, the department of natural resources, and the appropriate local government, shall be administered by the appropriate state agency in conjunction with the appropriate local government in a manner that will allow man to function in harmony with, rather than be destructive to, these resources. Consideration is to be given to the protection of those areas essential for wildlife habitat. Development in areas containing historical, archaeological, or natural resources shall be conducted in a manner which will minimize damage to those resources for future use.

(4) The following criteria shall be applicable to areas around key facilities:

(a) If the operation of a key facility may cause a danger to public health and safety or to property, as determined by local government, the area around the key facility shall be designated and administered so as to minimize such danger; and

(b) Areas around key facilities shall be developed in a manner that will discourage traffic congestion, incompatible uses, and expansion of the demand for government services beyond the reasonable capacity of the community or region to provide such services as determined by local government. Compatibility with nonmotorized traffic shall be encouraged. A development that imposes burdens or deprivation on the communities of a region cannot be justified on the basis of local benefit alone.

(5) In addition to the criteria described in subsection (4) of this section, the following criteria shall be applicable to areas around particular key facilities:

(a) Areas around airports shall be administered so as to:

(I) Encourage land use patterns for housing and other local government needs that will separate uncontrollable noise sources from residential and other noise-sensitive areas; and

(II) Avoid danger to public safety and health or to property due to aircraft crashes.

(b) Areas around major facilities of a public utility shall be administered so as to:

(I) Minimize disruption of the service provided by the public utility; and

(II) Preserve desirable existing community patterns.

(c) Areas around interchanges involving arterial highways shall be administered so as to:

(I) Encourage the smooth flow of motorized and nonmotorized traffic;

(II) Foster the development of such areas in a manner calculated to preserve the smooth flow of such traffic; and

(III) Preserve desirable existing community patterns.

(d) Areas around rapid or mass transit terminals, stations, or guideways shall be developed in conformance with the applicable municipal master plan adopted pursuant to section 139-59-6, C.R.S. 1963, or any applicable master plan adopted pursuant to section 106-2-7. If no such master plan has been adopted, such areas shall be developed in a manner designed to minimize congestion in the streets; to secure safety from fire, flood waters, and other dangers; to promote health and general welfare; to provide adequate light and air; to prevent the overcrowding of land; to avoid undue concentration of population; to facilitate the adequate provision of transportation, water, sewerage, schools, parks, and other public requirements. Such development in such areas shall be made with reasonable consideration, among other things, as to the character of the area and its peculiar suitability for particular uses, and with a view to conserving the value of buildings and encouraging the most appropriate use of land throughout the jurisdiction of the applicable local government.

106-7-203. Activities of state interest as determined by local governments. (I) Subject to the procedures set forth in part 4 of this article, a local government may designate certain activities of state interest from among the following:

(a) Site selection and construction of major new domestic water and sewage treatment systems and major extension of existing domestic water and sewage treatment systems;

(b) Site selection and development of solid waste disposal sites;

(c) Site selection of airports;

(d) Site selection of rapid or mass transit terminals, stations, and fixed guideways;

(e) Site selection of arterial highways and interchanges and collector highways;

(f) Site selection and construction of major facilities of

a public utility;

(g) Site selection and development of new communities;

(h) Efficient utilization of municipal and industrial water projects; and

(i) Conduct of nuclear detonations.

106-7-204. Criteria for administration of activities of state interest. (1) (a) New domestic water and sewage treatment systems shall be constructed in areas which will result in the proper utilization of existing treatment plants and the orderly development of domestic water and sewage treatment systems of adjacent communities.

(b) Major extensions of domestic water and sewage treatment systems shall be permitted in those areas in which the anticipated growth and development that may occur as a result of such extension can be accommodated within the financial and environmental capacity of the area to sustain such growth and development.

(2) Major solid waste disposal sites shall be developed in accordance with sound conservation practices and shall emphasize, where feasible, the recycling of waste materials. Consideration shall be given to longevity and subsequent use of waste disposal sites, soil and wind conditions, the potential problems of pollution inherent in the proposed site, and the impact on adjacent property owners, compared with alternate locations.

(3) Airports shall be located or expanded in a manner which will minimize disruption to the environment of existing communities, will minimize the impact on existing community services, and will complement the economic and transportation needs of the state and the area.

(4) (a) Rapid or mass transit terminals, stations, or guideways shall be located in conformance with the applicable municipal master plan adopted pursuant to section 139-59-6, C.R.S. 1963, or any applicable master plan adopted pursuant to section 106-2-7. If no such master plan has been adopted, such areas shall be developed in a manner designed to minimize congestion in the streets; to secure safety from fire, flood waters, and other dangers; to promote health and general welfare; to provide adequate light and air; to prevent the overcrowding of land; to avoid undue concentration of population; to facilitate the adequate provision of transportation, water, sewerage, schools, parks, and other public requirements. Activities shall be conducted with reasonable consideration, among other things, as to the character of the area and its peculiar suitability for particular uses, and with a view to conserving the value of buildings and encouraging the most appropriate use of land

throughout the jurisdiction of the applicable local government.

(b) Proposed locations of rapid or mass transit terminals, stations, and fixed guideways which will not require the demolition of residences or businesses shall be given preferred consideration over competing alternatives.

(c) A proposed location of a rapid or mass transit terminal, station, or fixed guideway that imposes a burden or deprivation on a local government cannot be justified on the basis of local benefit alone, nor shall a permit for such a location be denied solely because the location places a burden or deprivation on one local government.

(5) Arterial highways and interchanges and collector highways shall be located so that:

(a) Community traffic needs are met;

(b) Desirable community patterns are not disrupted; and

(c) Direct conflicts with adopted local government, regional, and state master plans are avoided.

(6) Where feasible, major facilities of public utilities shall be located so as to avoid direct conflict with adopted local government, regional, and state master plans.

(7) When applicable, or as may otherwise be provided by law, a new community design shall, at a minimum, provide for transportation, waste disposal, schools, and other governmental services in a manner that will not overload facilities of existing communities of the region. Priority shall be given to the development of total communities which provide for commercial and industrial activity, as well as residences, and for internal transportation and circulation patterns.

(8) Municipal and industrial water projects shall emphasize the most efficient use of water, including, to the extent permissible under existing law, the recycling and reuse of water. Urban development, population densities, and site layout and design of storm water and sanitation systems shall be accomplished in a manner that will prevent the pollution of aquifer recharge areas.

(9) Nuclear detonations shall be conducted so as to present no material danger to public health and safety. Any danger to property shall not be disproportionate to the benefits to be derived from a detonation.

PART 3

LEVELS OF GOVERNMENT INVOLVED AND THEIR FUNCTIONS

106-7-301. Functions of local government. (1) Pursuant to this article, it is the function of local government to:

(a) Designate matters of state interest after public hearing, taking into consideration:

(I) The intensity of current and foreseeable development pressures; and

(II) Applicable guidelines for designation issued by the applicable state agencies;

(b) Hold hearings on applications for permits for development in areas of state interest and for activities of state interest;

(c) Grant or deny applications for permits for development in areas of state interest and for activities of state interest;

(d) Receive recommendations from state agencies and other local governments relating to matters of state interest;

(e) Send recommendations to other local governments and the Colorado land use commission relating to matters of state interest; and

(f) Act, upon request of the Colorado land use commission, with regard to specific matters of state interest.

106-7-302. Functions of other state agencies. (1) Pursuant to this article, it is the function of other state agencies to:

(a) Send recommendations to local governments and the Colorado land use commission relating to designation of matters of state interest on the basis of current and developing information; and

(b) Provide technical assistance to local governments concerning designation of and guidelines for matters of state interest.

(2) Primary responsibility for the recommendation and provision of technical assistance functions described in subsection (1) of this section is upon:

(a) The Colorado water conservation board, acting in cooperation with the Colorado soil conservation board, with regard to floodplains;

(b) The Colorado state forest service, with regard to wildfire hazard areas;

(c) The Colorado geological survey, with regard to geologic hazard areas, geologic reports, and the identification of mineral resource areas;

(d) The Colorado division of mines, with regard to mineral extraction and the reclamation of land disturbed thereby;

(e) The Colorado soil conservation board and soil conservation districts, with regard to resource data inventories, soils, soil suitability, erosion and sedimentation, floodwater problems, and watershed protection; and

(f) The division of wildlife of the department of natural resources, with regard to significant wildlife habitats.

(3) Pursuant to section 106-7-202 (1) (d), the oil and gas conservation commission of the state of Colorado may identify an area of oil and gas development for designation by local government as an area of state interest.

PART 4

DESIGNATION OF MATTERS

OF STATE INTEREST - GUIDELINES FOR ADMINISTRATION

106-7-401. Designation of matters of state interest. (1) After public hearing, a local government may designate matters of state interest within its jurisdiction, taking into consideration:

(a) The intensity of current and foreseeable development pressures; and

(b) Applicable guidelines for designation issued by the Colorado land use commission after recommendation from other state agencies, if appropriate. In adopting such guidelines, the Colorado land use commission shall be guided by the standards set forth in this article applicable to local governments.

(2) A designation shall:

(a) Specify the boundaries of the proposed area; and

(b) State reasons why the particular area or activity is of state interest, the dangers that would result from uncontrolled development of any such area or uncontrolled conduct of such activity, and the advantages of development of such area or conduct of such activity in a coordinated manner.

106-7-402. Guidelines - regulations. (1) The local government shall develop guidelines for administration of the designated matters of state interest. The content of such guidelines shall be such as to facilitate administration of matters of state interest consistent with sections 106-7-202 and 106-7-204.

(2) A local government may adopt regulations interpreting and applying its adopted guidelines in relation to specific developments in areas of state interest and to specific activities of state interest.

(3) No provision in this article shall be construed as prohibiting a local government from adopting guidelines or regulations containing requirements which are more stringent than the requirements of the criteria listed in sections 106-7-202 and 106-7-204.

106-7-403. Technical and financial assistance. (1) Appropriate state agencies shall provide technical assistance to local governments in order to assist local governments in designating matters of state interest and adopting guidelines for the administration thereof.

(2) (a) The department of local affairs shall oversee and coordinate the provision of technical assistance and provide financial assistance as may be authorized by law.

(b) The department of local affairs shall determine whether technical or financial assistance or both are to be given to a local government on the basis of the local government's:

(I) Showing that current or reasonably foreseeable development pressures exist within the local government's jurisdiction; and

(II) Plan describing the proposed use of technical assistance and expenditure of financial assistance.

106-7-404. Public hearing - designation of an area or activity of state interest and adoption of guidelines by order of local government. (1) The local government shall hold a public hearing before designating an area or activity of state interest and adopting guidelines for administration thereof.

(2) (a) Notice, stating the time and place of the hearing and the place at which materials relating to the matter to be designated and guidelines may be examined, shall be published once at least thirty and not more than sixty days before the public hearing in a newspaper of general circulation in the county. The local government shall send written notice to the Colorado land use commission of a public hearing to be held for the purpose of designation and adoption of guidelines at least

thirty days and not more than sixty days before such hearing.

(b) Any person may request, in writing, that his name and address be placed on a mailing list to receive notice of all hearings held pursuant to this section. If the local government decides to maintain such a mailing list, it shall mail notices to each person paying an annual fee reasonably related to the cost of production, handling, and mailing such notice. In order to have his name and address retained on said mailing list, the person shall resubmit his name and address and pay such fee before January 31 of each year,

(3) Within thirty days after completion of the public hearing, the local government, by order, may adopt, adopt with modification, or reject the particular designation and guidelines; but the local government, in any case, shall have the duty to designate any matter which has been finally determined to be a matter of state interest and adopt guidelines for the administration thereof.

(4) After a matter of state interest is designated pursuant to this section, no person shall engage in development in such area and no such activity shall be conducted until the designation and guidelines for such area or activity are finally determined pursuant to this article.

(5) Upon adoption by order, all relevant materials relating to the designation and guidelines shall be forwarded to the Colorado land use commission for review.

106-7-405. Report of local government's progress. (1) Not later than one hundred eighty days after the effective date of this article, each local government shall report to the Colorado land use commission, on a form to be furnished by the Colorado land use commission, the progress made toward designation and adoption of guidelines for administration of matters of state interest.

(2) Upon the basis of the information contained in such reports and any information received pursuant to any other relevant provision of this article, the Colorado land use commission may take appropriate action pursuant to section 106-4-3(2)(a).

106-7-406. Colorado land use commission review of local government order containing designation and guidelines. (1) Not later than thirty days after receipt of a local government order designating a matter of state interest and adopting guidelines for the administration thereof, the Colorado land use commission shall review the contents of such order on the basis of the relevant provisions of part 2 of this article and shall accept the designation and guidelines or recommend modification thereof.

(2) If the Colorado land use commission decides that modification of the designation or guidelines is required, the Colorado land use commission shall, within said thirty-day period, submit to the local government written notification of its recommendations and shall specify in writing the modifications which the Colorado land use commission deems necessary for compliance with the relevant provisions of part 2 of this article.

(3) Not later than thirty days after receipt of the modifications recommended by the Colorado land use commission, a local government shall:

(a) Modify the original order in a manner consistent with the recommendations of the Colorado land use commission and resubmit the order to the Colorado land use commission; or

(b) Notify the Colorado land use commission that the Colorado land use commission's recommendations are rejected.

106-7-407. Colorado land use commission may initiate identification, designation, and promulgation of guidelines for matters of state interest. (1) (a) The Colorado land use commission may submit a formal request to a local government to take action with regard to a specific matter which said commission considers to be of state interest within the local government's jurisdiction. Such request shall identify the specific matter and shall set forth the information required in section 106-7-401 (2) (a) and (2) (b). Not later than thirty days after receipt of such request, the local government shall publish notice and hold a hearing within sixty days pursuant to the provisions of section 106-7-404, and issue its order thereunder.

(b) After receipt by a local government of a request from the Colorado land use commission pursuant to paragraph (a) of this subsection (1), no person shall engage in development in the area or conduct the activity specifically described in said request until the local government has held its hearing and issued its order relating thereto.

(c) If the local government's order fails to designate such matter and adopt guidelines therefor, or, after designation, fails to adopt guidelines therefor pursuant to standards set forth in this article applicable to local governments, the Colorado land use commission may seek judicial review of such order or guidelines by a trial de novo in the district court for the judicial district in which the local government is located. During the pendency of such court proceedings, no person shall engage in development in the area or conduct the activity specifically described in said request except on such terms and conditions as authorized by the court.

PERMITS FOR DEVELOPMENT IN AREAS OF STATE INTEREST AND FOR

CONDUCT OF ACTIVITIES OF STATE INTEREST

106-7-501. Permit for development in area of state interest or for conduct of an activity of state interest required. (1)

(a) Any person desiring to engage in development in an area of state interest or to conduct an activity of state interest shall file an application for a permit with the local government in which such development or activity is to take place. The application shall be filed on a form prescribed by the Colorado land use commission. A reasonable fee determined by the local government sufficient to cover the cost of processing the application, including the cost of holding the necessary hearings, shall be paid at the time of filing such application.

(b) The requirement of paragraph (a) of this subsection (1) that a public utility obtain a permit shall not be deemed to waive the requirements of article 5 of chapter 115, C.R.S. 1963, that a public utility obtain a certificate of public convenience and necessity.

(2) (a) Not later than thirty days after receipt of an application for a permit, the local government shall publish notice of a hearing on said application. Such notice shall be published once in a newspaper of general circulation in the county, not less than thirty nor more than sixty days before the date set for hearing, and shall be given to the Colorado land use commission. The Colorado land use commission may give notice to such other persons as it determines not later than fourteen days before such hearing.

(b) If a person proposes to engage in development in an area of state interest or for conduct of an activity of state interest not previously designated and for which guidelines have not been adopted, the local government may hold one hearing for determination of designation and guidelines and granting or denying the permit.

(c) The local government may maintain a mailing list and send notice of hearings relating to permits in a manner similar to that described in section 106-7-404 (2) (b).

(3) The local government may approve an application for a permit to engage in development in an area of state interest if the proposed development complies with the local government's guidelines and regulations governing such area. If the proposed development does not comply with the guidelines and regulations, the permit shall be denied.

(4) The local government may approve an application for a

permit for conduct of an activity of state interest if the proposed activity complies with the local government's regulations and guidelines for conduct of such activity. If the proposed activity does not comply with the guidelines and regulations, the permit shall be denied.

(5) The local government conducting a hearing pursuant to this section shall:

(a) State, in writing, reasons for its decision, and its findings and conclusions; and

(b) Preserve a record of such proceedings.

(6) After the effective date of this article, any person desiring to engage in a development in a designated area of state interest or to conduct a designated activity of state interest who does not obtain a permit pursuant to this section may be enjoined by the Colorado land use commission or the appropriate local government from engaging in such development or conducting such activity.

106-7-502. Judicial review. The denial of a permit by a local government agency shall be subject to judicial review in the district court for the judicial district in which the major development or activity is to occur.

SECTION 2. Article 3 of chapter 106, Colorado Revised Statutes 1963, as amended, is amended BY THE ADDITION OF A NEW SECTION to read:

106-3-9. Statewide program for identification of matters of state interest as part of local land use planning. (1) The department of local affairs shall conduct a statewide program encouraging counties and municipalities to prepare, as a part of the comprehensive plan provided for in section 106-2-5 and article 59 of chapter 139, C.R.S. 1963, a complete and detailed identification and designation of all matters of state interest within each county by June 30, 1976. The general assembly shall appropriate funds for this purpose to the department of local affairs for distribution to participating counties. Each county desiring to participate in the identification and designation of matters of state interest program established by this section shall be allocated an equal amount by the department of local affairs from the funds so appropriated, to be expended by each county separately or through an organized group of counties or counties and municipalities. The department of local affairs, in cooperation with applicable state agencies, shall establish reasonable standards relative to the scope, detail, and accuracy of the program and shall insure that all information is comparable for each county. Each county shall, after consultation with the municipality, prepare such identification and designation for territory located within these municipalities

which request such preparation and in any municipality which fails to undertake an identification and designation program. Each county shall, upon request of the municipality, assist the municipality in its identification and designation program.

(2) The general assembly shall appropriate to the department of local affairs funds to assist counties and municipalities participating in the identification and designation of matters of state interest program, where additional assistance is deemed by the department of local affairs to be necessary. The department of local affairs shall also allocate such funds upon request of any county participating in the identification and designation of matters of state interest program under subsection (1) of this section for implementation of supplemental planning in that county, or to any municipality, based upon priorities established by the department of local affairs and on the need and capabilities of each county and municipality.

SECTION 3. 106-4-3 (2) (a), Colorado Revised Statutes 1963 (1971 Supp.), is amended to read:

106-4-3. Duties of the commission - temporary emergency power. (2) (a) Whenever in the normal course of its duties as set forth in this article the commission determines that there is in progress or proposed a land development activity which constitutes a danger of irreparable injury, loss, or damage of serious and major proportions to the public health, welfare, or safety, the commission shall immediately give written notice to the board of county commissioners of each county involved of the pertinent facts and dangers with respect to such activity. If the said board of county commissioners does not remedy the situation within a reasonable time, the commission may request the governor to review such facts and dangers with respect to such activity. If the governor grants such request, such review shall be conducted by the governor at a meeting with the commission and the boards of county commissioners of the counties involved. If, after such review, the governor shall determine that such activity does constitute such a danger, the governor may direct the commission to issue its written cease and desist order to the person in control of such activity. Such order shall require that such person immediately discontinue such activity. If such activity, notwithstanding such order, is continued, the commission may apply to any district court of this state in which such activity is located for a temporary restraining order, preliminary injunction, or permanent injunction, as provided for in the Colorado rules of civil procedure. Any such action shall be given precedence over all other matters pending in such district court. The institution of such action shall confer upon said district court exclusive jurisdiction to determine finally the subject matter thereof.

SECTION 4. Article 4 of chapter 106, Colorado Revised

Statutes 1963, as amended, is amended BY THE ADDITION OF A NEW SECTION to read:

106-4-5. Commission staff to assist counties and municipalities. The commission, within available appropriations, shall assign full-time professional staff members to assist counties and municipalities in the program established under article 7 of this chapter and to monitor progress in the same. No later than February 1, 1975, the commission shall issue its report to the general assembly as to progress being made in such program and shall include in its report those items required by section 106-4-4 (4) (b) and (4) (c).

SECTION 5. Appropriation. (1) There is hereby appropriated to the department of local affairs, out of any moneys in the state treasury not otherwise appropriated, the sum of two million seventy-five thousand dollars (\$2,075,000), or so much thereof as may be necessary, to implement the provisions of section 106-3-9, C.R.S. 1963, which moneys shall become available upon passage of this act and remain available until June 30, 1975, to be allocated as follows: Identification and designation of matters of state interest program - one million five hundred seventy-five thousand dollars (\$1,575,000); supplemental planning - five hundred thousand dollars (\$500,000).

(2) There is hereby appropriated out of any moneys in the state treasury not otherwise appropriated, to the Colorado land use commission, for the fiscal year beginning July 1, 1974, the sum of three hundred thousand dollars (\$300,000), or so much thereof as may be necessary, to provide assistance to counties and municipalities pursuant to section 106-4-5, C.R.S. 1963 (10.0 FTE, five of which shall be full-time professional staff pursuant to said section 106-4-5).

SECTION 6. Safety clause. The general assembly hereby

finds, determines, and declares that this act is necessary for the immediate preservation of the public peace, health, and safety.

John D. Fuhr
SPEAKER OF THE HOUSE
OF REPRESENTATIVES

Ted L. Strickland
ACTING PRESIDENT
OF THE SENATE

Lorraine F. Lombardi
CHIEF CLERK OF THE HOUSE
OF REPRESENTATIVES

Comfort W. Shaw
SECRETARY OF
THE SENATE

APPROVED

John D. Vanderhoof
GOVERNOR OF THE STATE OF COLORADO

An Act

HOUSE BILL NO. 1034. BY REPRESENTATIVES Dittemore, Buechner, Frank, Gaon, Herzberger, Lamm, Lloyd, Miller, Pettie, Safran, Quinlan, Arnold, Bendelow, DeMoulin, Farley, Hayes, Howe, Sack, Smith, and Valdez; also SENATORS Allshouse, Darby, Garnsey, Johnson, Kinnie, Locke, Minister, Plock, Wunsch, L. Fowler, Schieffelin, and Strickland.

ENACTING "THE LOCAL GOVERNMENT LAND USE CONTROL ENABLING ACT OF 1974".

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. Chapter 106, Colorado Revised Statutes 1963, as amended, is amended BY THE ADDITION OF A NEW ARTICLE to read:

ARTICLE 8

Local Government Land Use Control

Enabling Act

106-8-101. Short title. This article shall be known and may be cited as the "Local Government Land Use Control Enabling Act of 1974".

106-8-102. Legislative declaration. The general assembly hereby finds and declares that in order to provide for planned and orderly development within Colorado and a balancing of basic human needs of a changing population with legitimate environmental concerns, the policy of this state is to clarify and provide broad authority to local governments to plan for and regulate the use of land within their respective jurisdictions. Nothing in this article shall serve to diminish the planning functions of the state or the duties of the division of planning.

106-8-103. Definitions. As used in this article, unless the context otherwise requires:

(1) "Local government" means a county, home rule or statutory city, town, territorial charter city, or city and county.

106-8-104. Powers of local governments. (1) Without limiting or superseding any power or authority presently exercised or previously granted, each local government within its respective jurisdiction has the authority to plan for and regulate the use of land by:

(a) Regulating development and activities in hazardous areas;

(b) Protecting lands from activities which would cause immediate or foreseeable material danger to significant wildlife habitat and where an activity would endanger a wildlife specie;

(c) Preserving areas of historical and archaeological importance;

(d) Regulating, with respect to the establishment of, roads on public lands administered by the federal government; this authority includes authority to prohibit, set conditions, or require a permit for the establishment of any road authorized under the general right-of-way granted to the public by 43 U.S.C. 932 (R.S. 2477) but does not include authority to prohibit, set conditions, or require a permit for the establishment of any road authorized for mining claim purposes by 30 U.S.C. 21 et seq., or under any specific permit or lease granted by the federal government;

(e) Regulating the location of activities and developments which may result in significant changes in population density;

(f) Providing for phased development of services and facilities;

(g) Regulating the use of land on the basis of the impact thereof on the community or surrounding areas; and

(h) Otherwise planning for and regulating the use of land so as to provide planned and orderly use of land and protection of the environment in a manner consistent with constitutional rights.

106-8-105. Intergovernmental cooperation. Without limiting or superseding any power or authority presently exercised or previously granted, local governments are authorized and encouraged to cooperate or contract with other units of government pursuant to article 2 of chapter 88, C.R.S. 1963, for

the purposes of planning or regulating the development of land, including but not limited to the joint exercise of planning, zoning, subdivision, building, and related regulations.

106-8-106. Receipt of funds. Without limiting or superseding any authority presently exercised or previously granted, local governments are hereby authorized to receive and expend funds from other governmental and private sources for the purposes of planning for or regulating the use of land within their respective jurisdictions.

106-8-107. Compliance with other requirements. Where other procedural or substantive requirements for the planning for or regulation of the use of land are provided by law, such requirements shall control.

SECTION 2. 106-2-20, Colorado Revised Statutes 1963, is amended to read:

106-2-20. Temporary regulations. The board of county commissioners of any county, after appointment of a county or district planning commission and pending the ~~completion~~ ADOPTION by such commission of a zoning plan, where in the opinion of the board conditions require such action, may promulgate, by resolution without a public hearing, regulations of a temporary nature, to be effective for a limited period only and in any event not to exceed six months, prohibiting or regulating in any part or all of the unincorporated territory of the county or district the erection, construction, reconstruction, or alteration of any building or structure used or to be used for any business, RESIDENTIAL, industrial, or commercial purpose.

SECTION 3. Safety clause. The general assembly hereby

finds, determines, and declares that this act is necessary for the immediate preservation of the public peace, health, and safety.

John D. Fuhr
SPEAKER OF THE HOUSE
OF REPRESENTATIVES

Ted L. Strickland
ACTING PRESIDENT
OF THE SENATE

Lorraine F. Lombardi
CHIEF CLERK OF THE HOUSE
OF REPRESENTATIVES

Comfort W. Shaw
SECRETARY OF
THE SENATE

APPROVED

John D. Vanderhoof
GOVERNOR OF THE STATE OF COLORADO

COLORADO ANNEXATION LAW
(ANNEXATION TO CRAIG AND/OR MEEKER)

Territory in the State of Colorado may be annexed to a city... providing the territory is eligible...provided the procedure set out in sections 139-10-3 and 139-10-4 shall have been complied with...

Territory shall be eligible for annexation if such territory:

- Is not part of another incorporated place.
- Abuts upon or is contiguous to the incorporated place to which it is to be annexed in a manner affording reasonable ingress and egress, provided that not less than one-sixth of the aggregate external boundaries of the territory proposed to be annexed must coincide with existing boundaries of the annexing municipality.
- Is such that the noncontiguous boundaries thereof coincide with existing block lines, or center lines of established streets, roads, highways, or alleys, or with governmental subdivision lines for purposes of identification whenever this is possible.
- Territory annexations shall be initiated by written petition presented to the legislative body of the incorporated place, signed by the owners of more than 50 percent of the area of such territory who shall also comprise a majority of the landowners residing in the territory at the time the petition is filed.
- Where all documents are found to be in order (and no qualified counterpetition has been filed - Section 139-10-4) the legislative body, by resolution, accepts or rejects the petition.
- Where legislative body accepts the petition, it shall approve the annexation by ordinance, but not sooner than 30 days after the first publication of notice of petition (Section 139-10-4).
- Annexation shall be effective as of the adoption date of the ordinance but general taxation shall not become effective until the first day of January following.

APPENDIX D

RECORDED MINERAL LEASES
AS OF SEPTEMBER, 1974

(Note: Refer to Presentation Map 8 available separately
from this report for Lease locations)

*Route on a
map*

COAL LEASES IN MOFFAT, ROUTT AND RIO BLANCO COUNTIES

<u>COORDINATE NUMBER</u>	<u>LEASE HOLDER, ADDRESS, SECTION, TOWNSHIP, RANGE</u>
365/13	K. Pany P.O. Box 667 Santa Fe, New Mexico 87501 Sec. 31, T4N, R92W Sec. 36, T4N, R93W
345/13	Ark Land Co. P.O. Box 6083 Shelldan, Wyoming 82801 Sec. 16, T7N, R91W Sec. 16, 36, T7N, R92W Sec. 36, T8N, R92W Sec. 16, 36, T7N, R93W Sec. 36, T8N, R93W Sec. 25, 35, 36, T7N, R94W Sec. 36, T8N, R94W 6070.58 acres
358/13	Empire Energy Corporation c/o Pleasant & Peck Attorneys P.O. Box 1055, Craig Co. 81625 Sec. 16, T5N, R90W Sec. 16, T6N, R90W Sec. 16, T5N, R91W 1920 acres
370/13	The Kemmerer Coal Company Frontier, Wyoming 83121 Sec. 16, T12N, R90W Sec. 16, T12N, R91W Sec. 36, T12N, R91W 1920 acres (out of area)
366/13	Empire Energy Corporation Sec. 29, 31, 32, T6N, R91W 1318.17 acres
206/13	Utah International Inc. 550 California St. San Francisco Sec. 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 27, 28, 29, 31, 33, 34, 35, 36, T6N, R91W 9843.25 acres

307/13 Peabody Coal Co.
301 N. Memorial Dr.
St. Louis, Mo. 63102
Sec. 36, T8N, R90W
640 acres

285/13 John J. Wanner
410 Boston Building
Denver, Co. 80202
Sec. 36, T4N, R90W
Sec 16, T5N, R92W

372/13 Mapco Inc.
1437 So. Boulder Ave.
Tulsa, Oklahoma 74119
Sec. 17, 18, 19, 20, T6N, R88W
Sec. 26, 27, T6N, R88W
Sec. 4, 5, 8, 9, 10, 11, 14, 15, 16, 22, 23,
24, 25, 26, 31, 32, 33, 34, 35, T7N, R88W
Sec. 1, 2, 3, 4, 6, 12, 13, 19, 29, 30, 31,
32, T6N, R89W
Sec. 36, T7N, R89W
Sec. 36, T6N, R90W
Sec. 36, T7N, R90W
Total acres 18,276.43

401/13 Charles C. Hughes
1050 First National Bank Building
Denver, Colorado 80202
Sec. 8, 9, 16, 17, T4N, R95W
Sec. 33, 34, T5N, R95W
Sec. 16, 36, T5N, R96W
1917.42 acres

402/13 Charles C. Hughes
Sec. 36, T4N, R95W
640 acres

410/13 Robert H. Gleason
401-A Lincoln Avenue Box 910
Steamboat Springs, Colorado 80477
Sec. 9, 10, 15, 16, T3N, R98W
640 acres (out of area)

409/13 Robert H. Gleason
Sec. 9, 16, T4N, R98W
378.32 acres (out of area)

397/13 George Brennan, Jr.
5757 Coal Mine Rd.
Littleton, Colorado 80123
Sec. 36, T5N, R98W
40 acres

286/13 Arnold R. Gilbert
2040 Welton
Denver, Colorado 80202
12693 W. Alabama Way
Lakewood, Colorado 80220
Sec. 8, 9, 16, 17, T4N, R94W
627.67 acres

257/13 Utah International Inc.
550 California Street
San Francisco, California
Sec. 16, T3N, R93W
Sec. 16, 36, T6N, R93W
Sec. 36, T4N, R94W
2,400.16 acres

299/13 Arnold R. Gilbert
12693 W. Alabama Way
Lakewood, Colorado 80228
Sec. 16, T3N, R94W
640 acres

324/13 George Brennan Jr.
5757 Coal Mine Road
Littleton, Colorado 80120
Sec. 30, 31, T4N, R97W
Sec. 25, 36, T4N, R98W
489.52 acres (out of area)

332/13 George Brennan Jr.
Sec. 16, 9, 10, 15, 16, T4N, R98W
261.68 acres (out of area)

325/13 George Brennan Jr.
Sec. 36, T5N, R98W
200 acres (out of area)

333/13 George Brennan
Sec. 36, T5N, R98W
400 acres (out of area)

BLM COAL PERMIT APPLICATIONS - MOFFAT, RIO BLANCO, ROUTT

CO127926 James C. Goodwin
15200 W. 26th Avenue
Golden, Colorado 80401
Sec. 17, 20, 21, 28, 29, 30, T3N, R93W
2097.98 acres

CO127927 James C. Goodwin
Sec. 13, 14, 22, 23, 24, 25, 26, 27, 28,
T3N, R93W
3023.82 acres

CO127891 James C. Goodwin
Sec. 6, 7, T3N, R93W
Sec. 1, 2, 3, 4, 9, 10, 11, 12, T3N, R94W
3926.49 acres

CI5846 Commonwealth Coal Co.
640 Continental National Bank Building
3333 So. Bannock Street
Englewood, Colorado 80110
Sec. 19, 20, 29, 30, T2N, R93W
480 acres

CI5897 Industrial Fuels Corporation
4438 E. Marion Way
Phoenix, Arizona 85018
Sec. 26, 27, 28, 29, 30, 33, 34, 35, 36,
T2N, R92W

CI5898 Industrial Fuels Corp.
Sec. 1, 2, 3, 4, 5, 6, 7, 8, 9, T2N, R92W
4590.43 acres

CI5900 Industrial Fuels Corp.
Sec. 10, 11, 12, 13, 14, 15, 16, 17, T2N, R92W
4957.56 acres

C3440 James C. Goodwin
Sec. 32, 33, T3N, R93W
Sec. 5, T2N, R93W
approximately 604.75 acres?

CI4737 Empire Energy Corp
Box 1055, Craig, Colorado 81625
Sec. 4, T3N, R90W
Sec. 17, 18, 19, 20, 21, 28, 29, 30, 31, 32,
33, T4N, R90W
Sec. 12, 14, 13, 22, 23, 24, 25, 26, 27, 35,
36, T4N, R91W
12,647.84 acres

BLM COAL LEASES - MOFFAT, RIO BLANCO, ROUTT COUNTIES

STREETEN
MINE?

D 033327	Gulf Oil Corp. Sec. 23, 24, 25, T4N, R86W 160 acres
D 034365	W.R. Grace & Co., Davis Grahm & Stubbs American National Bank Building Denver, Colorado 80202 Sec. 2, 3, 4, 9, 10, T3N, R93W Sec. 33, 34, T4N, R93W Total 2564.73 acres
D 041478	Hayden Bros. Coal Corporation 304 Tramway Building, Denver Sec. 18, T4N, R85W Sec. 13, T4N, R86W
D 046544	Robert L. Sullivan Box 82, Oak Creek, Colorado Sec. 22, T4N, R86W 80 acres
D 047201	Reliable Coal and Mining 4565 Cold Spring Rd. Indianapolis, Indiana 46208 Sec. 2, 3, T2N, R101W 513 acres (out of area) Sec. 10, 11, T2N, R101W
D 051376	Maneatis Sheep Co. Oak Creek, Colorado Sec. 12, 13, T3n, R86W 250.41 acres
D 051698	Thomas E. Barton Hayden, Colorado Sec. 12, T4N, R89W 146.26 acres
D 051718	John Mathews Oak Creek, Colorado (DEAD LEASE) Sec. 33, T4N, R86W July 1, 1974 60.91 acres
D 052546	Joe Petranovich Oak Creek, Colorado Sec. 22, 23, T4N, R86W 160 Acres

D 052547 Morgan Coal Company
 Sec. 28, 29, 32, 33, T5N, R86W
 Sec. 9, T4N, R86W
 1,579.38 acres

D 056298 Empire Energy Corp.
 Box 1055, Craig, Colorado
 Sec. 6, T5N, R91W
 41.21 acres

C 07518 Utah International, Inc.
 550 California Street
 San Francisco, California
 Sec. 1, 2, 3, 4, 9, 10, T5N, R91W
 Sec. 33, T6N, R91W
 2566.44 acres

C 07519 Utah International, Inc.
 Sec. 6, T5N, R90W
 Sec. 31, T6N, R90W
 1371.32 acres

C 012894 Silengo Brothers
 835 Steele Street
 Craig, Colorado
 Sec. 7, 18, T5N, R89W
 634.42 acres

C 021601 Gulf Oil Corp
 c/o John C. Denton
 610 Dwight Building
 Kansas City, Missouri

C 093716 Consolidation Coal Co.
 Sec. 2, T1N, R93W
 Sec. 24, 25, 26, 35, 36, T2N, R93W
 2060.71 acres

C 0114093 Peabody Coal Co.
 301 N. Memorial Drive
 St. Louis, Missouri 63102
 Sec. 17, 18, 19, 20, 29, 30, T5N, R87W
 1320 acres

C 0123476 Utah International, Inc.
 550 California Street
 San Francisco, California 94104
 Sec. 5, 6, T3N, R93W
 Sec. 29, 31, 32, T4N, R93W
 2255.22 acres

C 0125957	Peabody Coal Co. Sec. 9, 10, 15, 17, 18, 19, 20, 21, 22, T8N, R89W 3863 acres
C 0126480	Utah International, Inc. Sec. 6, T5N, R91W Sec. 29, 30, T6N, R91W 366.51 acres
C 0127592	Routt Mining Corp. Oak Creek, Colorado 80467 Sec 22, T4N, R86W 80 acres
C 0127865	Empire Energy Corp. Box 1055 Craig, Colorado 81625 Sec. 6, T5N, R91W 43.03 acres
C 028875	Paul E. Riebold Box 760 Rangely, Colorado 81648 Sec. 11, 14, 13, 15, 10, T2N, R101W 1175.22 acres (out of area)
C 245	Consolidated Coal Co. 3300 One Oliver Plaza Pittsburgh, Pa. 15222 Sec. 5, T2N, R93W Sec. 33, T3N, R93W 225.86 acres (out of area)
C 813	Utah International, Inc. Sec. 24, T6N, R91W 159.55 acres (out of area)
C 1545	Consolidation Coal Co. Sec. 20, 21, 28, 29, 32, 33, T2N, R93W 896.07 acres (out of area)
C 1546	Consolidation Coal Co. Sec. 9, 10, 15, 16, T2N, R93W 1096.73 acres (out of area)
C 023703	Moon Lake Electric Association Vernal, Utah Sec. 1, 2, 3, 4, T2N, R101W Sec. 32, 33, 34, 35, 36, T3N, R101W 2557.22 acres (out of area)

C 064414	James Ferne Craig, Colorado Sec. 10, T6N, R91W 40.10 acres (out of area)
C 076713	American Fuels Corp. 2917 Carlisle N.E. Albuquerque, N.M. 87110 Sec. 29, 32, T2N, R93W 320 acres (out of area)
C 079641	Utah International Inc. 550 California Street San Francisco, California 94104 Sec. 5, T5N, R90W Sec 32, T6N, R90W 1351.84 acres (out of area)
C 081251	The United Electric Coal Co. 307 North Michigan Avenue Chicago, Illinois Sec. 8, 9, 10, 15, 20, 21, 22, T5N, R88W Sec. 14, T5N, R88W 2519.03 acres
C 081258	United Electric Coal Co. Sec. 23, 26, 27, 33, 34, 35, T5N, R88W 2323.44 acres
C 081330	Morgan Coal Co. 2850 No. Meridian Street Indianapolis, Indiana Sec. 21, 28, 29, 33, 20, T5N, R86W Sec. 8, 9, 17, 18, T4N, R86W 2215.28 acres
C 086654	Peabody Coal Co. Corp 301 N. Memorial Drive St. Louis, Missouri 63102 Sec. 10, T6N, R87W 160 acres
C 088199	Peabody Coal Co. Sec. 21, 22, 27, 28, 32, 33, 34, 35, T6N, R87W 2280 acres
C 093713	Consolidation Coal Co. 3300 One Oliver Plaza Pittsburgh, Pa. 15222 Sec. 1, 2, 11, 12, 13, 14, 24, T2N, R93W 2517.98 acres

C 093714

Consolidation Coal Co.
Sec. 22, 21, 23, 24, T2N, R93W
1450 acres (out of area)

C 093715

Consolidation Coal Co.
Sec. 2, 3, T1N, R93W
Sec. 26, 34, 35, T2N, R93W
1760 acres (out of area)

BLM COAL PERMITS - MOFFAT, RIO BLANCO, ROUTT COUNTIES

- C 8424 Moon Lake Electric Association, Inc
495 East Main Street
Vernal, Utah 84078
Sec 29, 30, 31, 32, 33, T3N, R101W
2552.32 acres (out of area)
- C 8425 Moon Lake Electric
Sec. 28, 33, 34, T3N, R101W
560 acres (out of area)
- C 4275 Phillip A. Jensen & K.W. Miller
Meeker, Colorado 81641
Sec. 5, 5, T1N, R92W
Sec. 31, 32, T2N, R92W
Sec. 1, T1N, R93W
1871.76 acres
- C 076713 American Fuels Corp
2917 Carlisle N.E.
Albuquerque, N.M. 87110
Sec. 29, 32, T2N, R93W
320 acres
- C 0125366 L.C. Craig
Steamboat Springs, Colorado
Sec. 22, T3N, R102W
640 acres (out of area)
- C 0126669 Staley-Gordon Coal Co., Inc.
c/o Beaslin, Nygaard, Coke & Vincent attn.
Suite 920, Boston Building
Salt Lake City, Utah 84111
Sec. 11, 12, T2N, R101W
259.06 acres (out of area)
- C 0126997 Ember Mining Co.
Box 13367
Kansas City, Missouri 64199
Sec. 19, 20, 30, 31, T2N, R93W
Sec. 23, 24, 25, 26, 36, T2N, R94W
3566.38 acres
- C 0126998 Ember Mining Co.
Sec. 2, 3, 4, 10, 11, 14, 15, T2N, R93W
Sec. 25, 27, 28, 33, T3N, R93W
5099.31 acres
- C 0126999 Ember Mining Co.
Sec. 27, 28, T2N, R93W
960 acres

STATE BOARD OF LAND COMMISSIONERS

COAL LEASES - MOFFAT, RIO BLANCO, ROUTT COUNTIES

- 265-13 Pittsburg & Midway Coal Mining Co.
15 W. 10th Street
Kansas City, Mo.
Sec. 3, 10, 11, 12, 13, 14, 15 -T5N, R86W
3,120.72 acres
- 371-13 Mapco Inc., A Delaware Corporation
1437 South Boulder Avenue
Tulsa, Oklahoma 74119
Sec. 4, 5, 6, 7, 8, 9, 17, 18, T5N, R86W
Sec. 22, 27, 28, 29, 31, 32, 33, 34, T6N, R86W
8,183.65 acres
- 383-13 Thomas C. Woodward
3620 Carmel Drive
Casper, Wyoming 82601
Sec. 20, T6N, R86W
Sec. 36, T7N, R87W
920.00 acres
- 364-13 K. Parry
P.O. Box 667
Santa Fe, New Mexico 87501
Sec. 20, 21, T6N, R86W
Sec. 16, 36, T7N, R87W
Sec. 36, T8N, R87W
1,040.00 acres
- 235-13 Morgan Coal Company
2850 No. Meridian Street
Indianapolis 8, Indiana
Sec. 1, 2, 3, 10, 11, 12, 13, 14, 15, T5N, R87W
3,843.85 acres
- 305-13 Peabody Coal Company, A Delaware Corporation
301 N. Memorial Drive
St. Louis, Missouri 63102
Sec. 3, 10, 15, 16, T5N, R87W
1,401.84 acres
- 306-13 Peabody Coal Company, A Delaware Corporation
301 N. Memorial Drive
St. Louis, Missouri 63102
Sec. 13, 14, T5N, R87W

323-13 Grassy Creek Coal Company
 c/o Warren L. Tomlinson
 Holland & Hart 500 Equitable Bldg.
 730 17th Street
 Denver, Colorado 80202
 Sec. 36, T6N, R87W
 320.00 acres

384-13 Driftwood Oil Corporation
 P. O. Box 622
 Casper, Wyoming 82601
 ASSGD, in Full to Peabody Coal Company
 Assmt. LSE. 408-13-S
 Sec. 36, T6N, R87W
 320 Acres

393-13 Page T. Jenkins
 830 Midland Savings Bldg.
 Denver, Colorado 80202
 Assgd in Full to Patrick J. McDonough
 Assmt. LSE. 399-13-S
 Sec. 6, T8N, R88W
 Sec. 7, T8N, R89W
 19,667.02 acres

303-13 Kemmerer Coal Company
 Frontier, Wyoming 83121
 Sec. 16, 17, 20, 21, T12, R88W
 633.07 acres (out of area)

279-13 The United Electric Coal Companies
 307 North Michigan Avenue
 Chicago, Illinois
 Sec. 16, T5N, R89W
 640 acres

266-13 Pittsburgh & Midway Coal Mining Co., A Corp.
 15 W. 10th Street
 Kansas City, Missouri
 Sec. 16, T8N, R89W
 640.00 acres

394-13 Sunflower Corporation
 1660 S. Albion, Suite 414
 Denver, Colorado 80222
 Sec. 3, T7N, R90W
 Sec. 16, T7N, R90W
 Sec. 26, 27, 34, T7N, R90W
 2,069.04 acres

COLORADO STATE BOARD OF LAND COMMISSIONERS

COAL LEASES

Moffat County - White River-Planning Area

August 26, 1974

<u>Township & Range</u>	<u>Sec</u>	<u>Description</u>	<u>Surface ownership State other(acres)</u>	<u>Lease No</u>
3N, 94W	16	all	640.00	299/13
4N, 94W	8	Lots 8, 9	28.58	286/13
	9	Lots 11,13,15,20, 23,24,25,26	201.03	286/13
	16	Lots 2,3,4,5,6,7, 9,12,13,15, 17	352.26	286/13
	17	Lots 1,4,5	45.80	286/13
	25	Lots 2,4,6,8,10, 11,12	213.39	257/13
	26	Lots 2,4	17.77	257/13
	35	Lots 1,4,5	31.14	257/13
	36	Lots 3-9,12,13, 15,17	377.85	257/13
4N,95W	8	Lots 7,16,17	33.70	401/13
	9	Lots 4-11,14-17	392.75	401/13
	16	Lots 2,3,5,7,	57.83	401/13
	17	Lot 1	6.96	401/13
	36	all	640.00	402/13
5N, 95W	33	Lots 2,4,6	75.24	401/13
	34	Lots 2,4	57.60	401/13
5N, 96W	16	all	640.00	401/13
	36	all	640.00	401/13

<u>Township & Range</u>	<u>Sec</u>	<u>Description</u>	<u>Surface ownership State other(acres)</u>	<u>Lease No</u>
4N, 97W	30	Lots 9, 11	22.42	324/13
	31	Lots 9,10,13	82.92	324/13
3N, 98W	9	Lots 2,4,6	51.63	410/13
	10	Lots 2,4	20.77	410/13
	15	Lots 2-5,8-10,12	162.83	410/13
	16	Lots 1-3,6-11,14, 15,17	404.77	410/13
4N, 98W	9	Lot 10	18.58	332/13
	9	Lots 12,14	34.64	409/13
	10	Lots 10,12	21.10	332/13
	15	Lots 2-5,8-10,12	160.58	332/13
	16	Lots 1-3,6-8,10, 11,14,15	343.68	409/13
	15	Lots 9,17	61.42	332/13
	36	Lots 1-3,6-11	344.52	324/13
5N, 98W	36	NE 1/4, NENE, SE 1/4	400.00	333/13
	36	W 1/2NW, NWSW S 1/2 SW	200.00	325/13
	36	NESW	40.00	397/13

LEASEHOLDERS AND ADDRESSES

257/13	Utah International Inc. 550 California Street San Francisco, Calif	332/13	George Brennan, Jr.
		333/13	George Brennan, Jr.
		397/13	George Brennan, Jr.
286/13	Arnold R. Gilbert 12693 W. Alabama Way Lakewood, Colo. 80228	401/13	Charles C. Hughes 1050 1st National Bank Bldg. Denver, Colo. 80202
299/13	Arnold R. Gilbert	402/13	Charles C. Hughes
324/13	George Brannan, Jr 5757 Coal Mine Rd. Littleton, Colo. 80123	409/13	Robert H. Gleason & L. C. Craig 401 A. Lincoln Ave. Steamboat Springs Colorado 80477
325/13	George Brennan, Jr.	410/13	Robert H. Gleason & L. C. Craig

HOUSING FACT SHEET

CRALD

PRESENT AND PROPOSED DEVELOPMENT

HOUSING UNIT

HOUSING AND CAPITAL FACILITIES

PART I. HOUSING

PART II. CAPITAL FACILITY STANDARDS

PART III. POPULATION FORECASTS BY MINERAL DEVELOPMENT

HOUSING FACT SHEET

CRAIG

PRESENT AND PROPOSED DEVELOPMENT

Housing Units

	<u>Total</u>	<u>Single Family</u>	<u>2+ Units</u>	<u>Mobile Homes</u>	<u>Vacant</u>
1970 ¹ Estimate	1734	1118	339	104	173
Add'l 70-74 ²	<u>590</u>	35	56	499 ³	
1974	2324			(spaces added, basically full)	

Proposed:⁴ Cedar View Development - 209 single family sites.

Craig West Subdivision - 150 single family sites, 200 in 2-4 plex units, 300 mobile home spaces.

Craig East Subdivision - 64 single family sites, 119 mobile homes subdivision, 84 mobile home lease sites.

Ridgeview Subdivision - 210 single family sites, 16.8 commercial frontage.

West View Subdivision - 16 single family sites.

Woodbury Subdivision - 201 single family sites.

Neilson, Inc. - 60 trailer spaces, temporary - for Neilson Inc. employees.

Colorado Ute - approximately 400 mobile home spaces leased for 5 years with option for 5 more. Later will develop single family homes on site. Leased to Stearns-Rogers & Colorado Ute employees only.

Presently for Sale or Rent:

Six houses for sale - on market because they are priced too high. Homes priced within market will sell in 2-3 days. If money loosens up these six houses will also probably sell quickly. Last rental was in June.⁵

Home
Ownership:

1970⁶ 65%

Population in
Housing Units:

1970 2,012

Persons per occupied units 3.0
Owner occupied units 3.0
Renter occupied units 2.9

Condition:

1970⁷ 41.8% built prior to 1940.
3.9% lack plumbing facilities which is only .3%
higher than the Colorado average.
5.9% have 1.01 or more persons per room which is
lower than Colorado average of 6.9%.

Values:

1970⁸ Owner occupied median value - \$14,700; renter occupied
median value \$76.
1974⁹ Sales range - \$20,000-\$50,000; average \$30,000 for
used homes and \$25/sq. fr. for new homes (equivalent
of \$37,500 for 1,500 sq. ft.) with fireplace, etc.
Rentals - 3 bedroom house with 1,200 sq. ft. to 1,500
sq. ft. rents for \$300/month; Range \$175-\$350.
Mobile homes - Trailers are \$15,000, pad rentals
\$80/month.

POTENTIAL DEVELOPMENT FACTORS

Land Values: Improved lots¹⁰ Two 25' x 150' lots, \$7,500-\$10,000.
Unimproved lots¹¹ - Two 25' x 150' lots, \$1,000-\$1,500.

Labor

Availability: No problem in getting construction laborers or
technicians.¹²

Present

Construction: Mostly factory housing - panel construction Mobile
Homes¹³.

FOOTNOTES:

- ¹U.S. Dept. of Commerce, Bureau of the Census, General Housing Characteristics Colorado 1970 Census of Housing, pg. 37.
- ²Building Permit Data Sheets, Craig, Colo. 1970 - Aug. 1974.
- ³Mobile Home Parks Fact Sheet - County Planning Office, Sept. 1974.
- ⁴Personal interview with Don Gibbony - County Planning Director, Moffat County, Aug. 16, 1974 and Sept. 24, 1974 and from New and Proposed Subdivisions Fact Sheet County Planning Office.
- ⁵Telephone interview with Homer Wilson, Western United Realty, Craig, Colo. Sept. 23, 1974.
- ⁶Op.cit. U.S. Dept. of Commerce
- ⁷ibid.
- ⁸op.cit. U.S. Dept. of Commerce, pg. 40.
- ⁹op.cit. Homer Wilson, Western United Realty
- ¹⁰ibid.
- ¹¹ibid.
- ¹²ibid.
- ¹³ibid.

HOUSING FACT SHEET

MEEKER

PRESENT AND PROPOSED DEVELOPMENT

Housing Units

	<u>Total</u>	<u>Single Family</u>	<u>2+ Units</u>	<u>Mobile Homes</u>	<u>Vacant</u>
1970 ¹	683	538	47	28	70
Estimate					
Add'l 70-74 ²	<u>56</u>	42	13	1	
Est. 1974	739				

Proposed: 12 unit apartment building³.

Sanderson Heights⁴ - Total 512 units: 132 single family, 46 units in duplexes and triplexes, 332 trailer homes.

Mobile Home Court⁵ - 400 spaces will be ready by July, 1975 if water and sewer connections are put in.

Presently for Sale or Rent:

None presently for sale or rent. Last sale or rental in Spring of 1974.⁶

Home Ownership:

1970⁷ 72%

Population in Housing Units:

1970 791

Persons per occupied unit	2.9
Owner occupied units	2.9
Renter occupied units	2.8

Condition:

1970⁸ Percentage not available for units built prior to 1940. 8.2% lacking some or all plumbing facilities, which is significantly higher than Colorado average.

6.9% have 1.01 or more persons/room which is the same as the Colorado average of 6.9%.

Values:

1970⁹ Owner occupied median value - \$11,300
Renter occupied median value - \$65.

1974¹⁰ Sales range - \$300,000-\$45,000 for used housing; six
new homes range - \$27,000-\$42,000.
Rental range - \$150-\$350.

Trailer pad rental estimate - \$60-\$70/month.

Prices are approximately double that of five years ago.

POTENTIAL DEVELOPMENT FACTORS

Land Values: Improved lots¹¹ - 70' x 150' - \$7,000-\$8,000.
Unimproved lots¹² - all are improved except possibly
for sewer and water. These lots would probably be
\$6,500-\$7,500.

Labor

Availability: There is a shortage of qualified construction laborers, but there are enough available for present needs. There are about 4-6 technicians who are busy but still available.

Present

Construction: Consists of both frame and factory housing.¹³

FOOTNOTES:

¹U.S. Dept. of Commerce, Bureau of the Census, General Housing Characteristics Colorado 1970 Census of Housing, pg. 42.

²Building Permit Data Sheets - Meeker, 1970-August, 1974.

³Telephone Interview with C. J. Wilson of White River Realty, Meeker, Colo. Sept. 23, 1974.

⁴Personal Interview with James Calhoun, City Manager, Meeker, Colo., August 16, 1974.

⁵ibid.

⁶op. cit., C. J. Wilson

⁷op. cit., U. S. Dept. of Commerce

⁸ibid.

⁹op. cit., U. S. Dept. of Commerce

¹⁰op. cit., C. J. Wilson

¹¹ibid.

¹²ibid.

¹³ibid.

HOUSING FACT SHEET

HAYDEN

PRESENT AND PROPOSED DEVELOPMENT

Housing Units

	<u>Total</u>	<u>Single Family</u>	<u>2+ Units</u>	<u>Mobile Homes</u>	<u>Vacant</u>
1970	No census data available for Hayden				
1974 ¹	503	350	23	130	0
Proposed:	<p>43 acre subdivision². Total units - 272: 72 single family, 200 apts. The subdivision is zoned and annexed and sewer and water commitments have been acquired. The water and sewer lines should go in the end of September, 1974. Owners plan to put in apartments first which should be ready by November or December, 1974.</p> <p>22 unit single-family home development³ presently under construction.</p> <p>92 acre subdivision⁴. Total units - 390 to 495: 10-15 single family, 80 units in duplexes, 300-400 apts. The subdivision is annexed and zoned but will require laying half mile of water and sewer lines to make connections and will, therefore, be later to develop than the other two proposals.</p> <p>Mobile Home Court⁵ - proposed but turned down in the fall of 1973. If approached in a different manner, this project might be approved and zoned. This project would provide for approximately 320 trailer spaces. The City is, however, generally against trailer development.</p>				

Presently for Sale or Rent:

None available for sale or rent. Trailer parks are almost all full.⁶

Home

Ownership: Not Available.

Condition: Not Available.

Values:

1970 Not Available

1974⁷ Sales range - \$24,000-\$30,000 used housing
\$25,000-\$30,000 new homes
Rental range- \$140-\$200/month
Trailer rentals - Trailer: \$125-225/month; Pad:
\$60-75/month

Prices have not changed much in the last five years.

POTENTIAL DEVELOPMENT FACTORS

Land Values: Improved building lots⁸ - approximately \$6,000-\$7,000.
Unimproved building lots⁹ - price varies depending
on location but approximately \$2,000.

Labor

Availability: The building inspector feels there is no problem
presently because of the building slump in Steam-
boat and therefore construction workers and
technicians are now available for Hayden.
Also workers from the Steam Plant who work on shifts
sometimes do construction work in their free time.¹⁰

The High School Principal felt that there is a lack
of workers, especially technicians.¹¹

Present

Construction: Primarily modular housing and factory housing.

FOOTNOTES:

¹Personal interview with City Clerk, Hayden, Colorado, Sept. 5, 1974.

²Telephone interview with Tom Foster, Consulting Engineer for Hayden, Building Inspector, and Municipal Judge, Hayden, Colorado, Sept. 23, 1974.

³ibid.

⁴ibid.

⁵ibid.

⁶ibid.

⁷ibid.

⁸ibid.

⁹ibid.

¹⁰ibid.

¹¹Personal interview with High School Principal, Hayden, Colorado, Sept. 5, 1974.

TABLE E-1

**SELECTED HOUSING CHARACTERISTICS
YEAR MOVED INTO UNIT
TRI-COUNTY AREA
1970**

	Moffat County		Routt County		Rio Blanco County		Tri-County Region	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Owner Occupied								
1969-1970	121	8.6	266	17.4	140	15.5	527	13.7
1968	54	3.9	90	5.9	33	3.7	177	4.6
1965-1967	260	18.0	239	15.6	172	19.0	671	17.5
1960-1964	346	24.7	251	16.4	168	18.6	765	19.9
1950-1959	313	22.3	334	21.7	170	18.8	817	21.3
1949 & earlier	307	21.9	353	23.0	221	24.4	881	23.0
Total	1,401	100.0	1,533	100.0	904	100.0	3,838	100.0
Renter Occupied								
1969-1970	315	46.5	347	55.4	258	45.3	920	49.1
1968	122	18.0	110	17.6	57	10.0	289	15.4
1965-1967	146	21.5	73	11.7	101	17.7	320	17.1
1960-1964	34	5.0	58	9.3	87	15.3	179	9.6
1950-1959	21	3.1	13	2.1	47	8.2	81	4.3
1949 & earlier	40	5.9	25	3.9	20	3.5	85	4.5
Total	678	100.0	626	100.0	570	100.0	1,874	100.0

Source: U.S. Bureau of Census, Census of Housing, 1970, Detailed Housing Characteristics HC(1)B-7.

TABLE E-2

**DISTRIBUTION OF OWNER UNITS BY PRICE RANGE FOR
TRI-COUNTY REGION AND COLORADO
1970**

Price Range	Moffat County		Routt County		Rio Blanco County		Region		Colorado	
	No. Units	Percent	No. Units	Percent	No. Units	Percent	No. Units	Percent	No. Units	Percent
Less Than \$5,000	76	8.1	143	14.4	58	10.9	277	11.3	11,997	3.3
\$5,000-\$9,999	166	17.7	241	24.2	129	24.2	536	21.8	42,962	11.9
\$10,000-\$14,999	266	28.4	246	24.7	158	29.6	670	27.1	79,654	22.2
\$15,000-\$19,999	260	27.8	118	11.9	96	18.0	474	19.2	93,857	26.0
\$20,000-\$24,999	80	8.5	115	11.6	35	6.5	230	9.3	58,794	16.3
\$25,000-\$34,999	71	7.6	76	7.6	48	9.0	195	7.9	47,618	13.3
\$35,000 or More	18	1.9	56	5.6	10	1.8	84	3.4	25,260	7.0
Total	937	100.0	995	100.0	534	100.0	2,466	100.0	360,142	100.0
Median Price	\$14,100		\$11,500		\$12,500				\$17,400	

Source: U.S. Bureau of Census, *Census of Housing, 1970, General Housing Characteristics, Hc(1)-A7*

CAPITAL FACILITY STANDARDS

In order to determine facility capacities, general service standards and requirements have been used. It is recognized that standards and requirements do vary according to local conditions but the ones used here do appear to be suitable for the conditions in northwest Colorado.

Water

Water supply requirements can be expected to range between .10 and .50 acre feet per year per person for all normal uses in a municipality. The State Engineer's office uses a supply figure of .20 acre feet per year per person in planning for municipalities. Using this figure, the total additional water supply demand by each 1000 person increment would be 200 acre feet per year.

A water treatment plant should be able to process a peak day's usage and still have 15 percent excess capacity. Estimated average per capita daily usage is 180 gallons per day. Peak water usage is generally 2.5 times the average daily usage or 450 gpd/capita.

Sewer

Average demand for wastewater treatment is about 100 gallons per capita per day.¹ However, sewers are generally built to handle the expected peak or greater flow. If 100 gallons per day is indeed the average per capita flow, the maximum expected daily flow would be about 168 gallons per capita.²

Solid Waste Disposal

In order to estimate the generation of solid waste the national average of five pounds per capita per day has been used.³ Annually, this would produce 814.7 tons of solid waste per 1000 population.

¹The Economics of Urban Sewage Disposal, Paul B. Downing, p.80.

²ibid.

³"Sanitary Land Fill Design and Operation," Kirk K. Breenner and Daniel J. Keller for U.S. Environmental Protection Agency, 1972, pg. 1.

The following assumptions were made to derive the amount of land necessary for disposal sites: 1) 5 lbs./capita/day of waste material, 2) waste compacted to 100 lbs./cubic yard., 3) a fill depth of 7 feet, 4) cover material obtained at the site, 5) 2/3's of the site actually covered by solid waste. Using these parameters, a total of .21 acres/1000 population is needed each year for solid waste disposal sites.

Based on average equipment requirements for a site serving fewer than 50,000 people, a tractor crawler is necessary. Optional accessories include a dozer blade, landfill blade, front-end loader and multi-purpose bucket. The accessory equipment necessary varies with the needs of the individual site.¹

Police

The number of policemen necessary to provide effective protection varies according to the nature of the area to be served and the size of its population. The towns in north-west Colorado do not possess any characteristics strikingly at variance with other towns of their size. Therefore, average figures will be used for guidelines in figuring their estimated needs.

Based on national averages and planning standards used by local police departments, a medium level of service for a typical town of 10,000 people or less would require two policemen per thousand population. Three policemen per thousand population would provide a high level of service and anything below 1.4 per 1000 would be inadequate.

For typical towns of over 10,000 population, 1.7 policemen per 1000 is necessary for a medium level of service. Anything below 1.4 per 1000 would be low; anything above 2 per 1000 would be high.

The number of patrol cars is figured on the basis of three policemen per car or approximately 1/2 to 2/3 car per thousand population. Other vehicle needs vary and are determined by the characteristics of each particular town. Vans and vehicles for meter maids are the most frequently acquired items. The building housing the police department should provide roughly 100 square feet per officer or 170-200 square feet per 1000 population increment.

¹"Sanitary Landfill Facts," Thomas J. Sorg & H. Lanier Hickman, Jr., for the U.S. Dept. of Health, Education & Welfare, 1970, pg. 21.

Fire

Recommended fire department strength is based on the individual town's required fire flow. Fire flow is based on the town's building composition and layout rather than population. A rather complicated formula is used to calculate fire flow:

$$\text{Fire flow} = 18(c)(A^{.05})^1$$

Where C = 1.5 for wooden frame buildings
1.0 for ordinary (wood-brick, etc. combinations) buildings
.8 for non-combustible buildings
.6 for fire-resistant buildings

and A = area of the building.

This formula is calculated for representative areas of town (e.g., an industrial area, a school, a typical residential area) and the results are compared and roughly averaged to determine required fire flow. In small towns the area or building requiring the greatest fire flow (quite often the high school) is the basic determinant of the town's fire flow. In other words, the town needs at least enough to protect that one area or building, and quite often the fire flow required for it is more than sufficient for the rest of the town. Most small towns (up to 10,000 population) will require 2000-2500 gallons per minute.

Table E-3, following, indicates the equipment necessary for fire departments according to a town's required fire flow. Many towns also acquire a rescue van and/or a chief's car.

Fire departments should be located such that no point in a high value district is more than 3/4 mile from an engine company, hose company, or engine-ladder company, or more than one mile from a company providing adequate ladder service. For residential areas, no closely built residential area should be more than 1 1/2 miles from an engine company, hose company, or engine-ladder service. Where buildings are scattered, there should be a fire department within three miles.

The Insurance Services Office gives each town a fire rating ranging on a scale from 1 to 10 -- one being the highest. Most small towns have a rating of 7 - 9. To raise this rating

¹Source: Insurance Services Office, Denver, Colorado (The National Fire Underwriters).

TABLE E-3

Number of Engine and Ladder Companies Needed
within Travel Distance of Required Fire Flow

Fire Flow	First Due ¹				First Alarm ²				Maximum Multiple Alarm			
	Eng.		Lad.		Eng.		Lad.		Eng.		Lad.	
	No.	Mi.	No.	Mi.	No.	Mi.	No.	Mi.	No.	Mi.	No.	Mi.
less than 2,000	1	1½+	*1	2++	**2	4	*1	2++	**2	4	*1	2++
2,000	1	1½+	*1	2++	2	2½	*1	2++	2	2½	*1	2++
2,500	1	1½	*1	2	2	2½	*1	2	2	2½	*1	2
3,000	1	1½	*1	2	2	2½	*1	2	3	3	*1	2
3,500	1	1½	*1	2	2	2½	*1	2	3	3	*1	2
4,000	1	1½	1	2	2	2½	1	2	4	3½	1	2
4,500	1	1½	1	2	2	2½	1	2	4	3½	1	2
5,000	1	1	1	1½	2	2	1	1½	5	3½	2	2½
5,500	1	1	1	1½	2	2	1	1½	5	3½	2	2½
6,000	1	1	1	1½	2	2	1	1½	6	4	2	2½
6,500	1	1	1	1½	2	2	1	1½	6	4	2	2½
7,000	1	1	1	1½	2	1½	1	1½	7	4	3	3½
7,500	1	1	1	1½	2	1½	1	1½	8	4½	3	3½
8,000	1	1	1	1½	2	1½	1	1½	9	4½	3	3½
8,500	1	1	1	1½	2	1½	1	1½	9	4½	3	3½
9,000	1	¾	1	1	3	1½	2	2	10	4½	4	4
10,000	1	¾	1	1	3	1½	2	2	12	5	5	4½
11,000	1	¾	1	1	3	1½	2	2	14	5	6	5
12,000	1	¾	1	1	3	1½	2	2	15	5	7	5

* Where there are less than 5 buildings of a height corresponding to 3 or more stories, a ladder company may not be needed to provide ladder service.

** Same as first due where only one engine company is required in the municipality. Use judgment.

+ May be increased to 2 miles for residential districts of 1- and 2-family dwellings, and to 4 miles where such dwellings have an average separation of 100 feet or more.

++ May be increased to 3 miles for residential districts of 1- and 2-family dwellings, and to 4 miles where such dwellings have an average separation of 100 feet or more.

¹ "First due" refers to the equipment needed to be within range to respond to a fire immediately.

² "First Alarm" refers to "first due" equipment plus additional equipment needed to be able to respond should fire prove to be too large to be handled by "First due" equipment.

SOURCE: Insurance Services Office, Denver, Colorado (The National Fire Underwriters).

generally requires acquiring better equipment, more men, and/or upgrading the water distribution system in town. Many small towns do not feel the property values in town warrant the increased expenditures for fire protection to improve their insurance rating.

Schools

For every 1000 persons in Moffat, Rio Blanco, and Routt Counties, on the average one can expect that there will be 150 elementary (grades K-6) aged school children, 45 junior high school (grades 7 and 8) aged students, and 60 high school students.¹

School capacities have been determined on the basis of the local school officials' estimates for the schools within their jurisdictions. Their estimates are based on about 25 students per classroom.

Recreation

The following guidelines are used in urban areas to meet open space and parkland demands.

<u>Type of Park²</u>	<u>Acres per 1000 Population</u>
Neighborhood Park	8.5
District Park	2.0
Regional Park	15.0

¹U.S. Dept. of Commerce Bureau of Census - 1970 Census of Population General Population Characteristics Colorado.

²Neighborhood Parks - parks primarily for the use of elementary age and younger children or senior citizens, located from within a block to within one mile.

District Parks - parks generally located adjacent to junior or senior high schools and oriented towards teenager use, frequently having tennis courts, swimming pools, recreation centers or similar facilities.

Regional Parks - larger parks, 100-250 acre minimum, having natural areas and space for outdoor activities such as hiking, riding, camping, and skiing, located within 30 minutes to one hour travel time.

Colorado has much open land which would effectively reduce the need for the suggested amounts of open space. However, with increasing population and densities, local governments should begin to acquire land in and adjacent to towns to meet future needs.

All towns, no matter how small, should provide its citizens a variety of recreation facilities, including, if possible, a swimming pool. The following table sets forth recreation facility needs for various population increments. These guidelines should be used in conjunction with the individual recreational interests of the population and adjusted accordingly in order to plan facilities.

TABLE E-4
Guideline Facilities

<u>Population Increment</u>	<u>Facilities Required</u>
1,000	1/2 acre developed playground 1 1/2 acres open field area 2 basketball courts 1 1/2 acres of sport fields/picnic areas
2,000	tennis court
3,000	softball field
5,000	wading pool
6,000	baseball field
10,000	25 yard outdoor pool
20,000	50 yard outdoor pool
25,000	indoor pool golf course football field community center

Other recreational facilities which are commonly provided are skating rinks, shooting ranges, campgrounds, handball courts, hiking, biking, and riding trails, horseshoe courts, miniature golf courses, model airplane areas, model boating ponds, nature trails, soccer fields, stables, wildlife preserves, zoological parks, and so forth.

Libraries

The table below sets forth standards for determine libraries' requirements in terms of number of volumes and space. Libraries should be planned for the estimated population twenty years in the future.

TABLE E-5

Guidelines For Determining Minimum Space Requirements¹

Population Served	Shelving Space		Amount of Floor Space	Total Floor Space
	Size of Book Collection	Linear Feet of Shelving		
Under 2,499	10,000 vol.	1,300 linear ft.	1,000 sq. ft.	2,000 sq. ft.
2,500-4,999	10,000 vol. plus 3 books per capita for pop. over 3,500	1,300 linear ft. Add 1 ft. of shelving for every 8 bks. over 10,000	1,000 sq. ft. Add 1 sq. ft. for every 10 bks. over 10,000	2,500 sq. ft. or 0.7 sq. ft. per capita, whichever is greater.
5,000-9,999	15,000 vol. plus 2 books per capita for pop. over 5,000.	1,875 linear ft. Add 1 ft. of shelving for every 8 bks. over 15,000.	1,500 sq. ft. Add 1 sq. ft. for every 10 bks. over 15,000.	3,500 sq. ft. or 0.7 sq. ft. per capita, whichever is greater.
10,000-24,999	20,000 vol. plus 2 books per capita for pop. over 10,000.	2,500 linear ft. Add 1 ft. of shelving for every 8 bks. over 20,000	2,000 sq. ft. Add 1 sq. ft. for every 10 bks. over 20,000.	7,000 sq. ft. or 0.7 sq. ft. per capita, whichever is greater.
25,000-49,999	50,000 vol. plus 2 books per capita for pop. over 25,000.	6,300 linear ft. Add 1 ft. of shelving for every 8 bks. over 50,000.	5,000 sq. ft. Add 1 sq. ft. for every 10 bks. over 50,000.	15,000 sq. ft. or 0.6 sq. ft. per capita, whichever is greater.

¹Source: Interim Standard for small Public Libraries: Guidelines Toward Achieving the Goals of Public Library Service (Public Library Assoc., 1962.)

Health

The Colorado Comprehensive Health Planning Office uses as a guideline the standard of one doctor needed per 1000 population. Anything less than .75 doctors per 1000 is considered low, and anything more than 1.25 doctors per 1000 is considered high. This is based on national and western states averages.

To calculate bed needs, there are several formulas. For the purposes of this report, the Hill-Burton standards are used, mainly because they are federal guidelines used by hospitals requesting federal aid. The major objection to the Hill-Burton Plan has been that it quite often resulted in excess capacity. However, the formula was revised in 1973, resulting in somewhat lower bed needs. The formula is as follows:

A. Current Use Rate:

$$\frac{\text{Patient days per year}}{\text{Current Population}} = \text{current use rate}$$

B. Average Bed Need:

$$\frac{\text{Current use rate} \times \text{projected population}}{365} = \text{average bed need per day (for projection year)}$$

C. Bed Need:

$$\frac{\text{Average bed need per day}}{(.80 = \text{occupancy rate})} = \text{bed need (for projection year)}$$

APPENDIX F

PART I

EMPLOYMENT AND POPULATION ALLOCATIONS FOR CRAIG, HAYDEN AND MEEKER

(SELECTED YEARS)

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EMPLOYMENT AND POPULATION ALLOCATIONS

FORECAST 1 - FILED LETTERS OF INTENT

LOCATION	YEAR	EMPLOYMENT				POPULATION			
		PRODN	CONST	SERV	TOTAL	PRODN	CONST	SERV	TOTAL
CRAIG	1976	125	1,197	364	1,686	430	2,392	1,277	4,099
	1978	384	512	312	1,208	1,348	1,025	1,095	3,468
	1980	589	425	400	1,414	2,177	848	1,399	4,424
	1985	788	0	384	1,172	2,756	0	1,348	1,404
	1990	793	0	387	1,180	2,776	0	1,355	4,131
	1995	795	0	387	1,182	2,785	0	1,362	4,147
HAYDEN	1976	23	20	12	55	79	39	44	162
	1978	17	48	20	85	59	95	72	226
	1980	68	21	37	126	251	41	131	423
	1985	75	0	36	111	261	0	125	386
	1990	73	0	35	108	256	0	122	378
	1995	73	0	34	107	254	0	121	375
MEEKER	1976	28	38	18	84	97	75	66	218
	1978	25	60	27	112	91	120	98	309
	1980	79	160	84	323	294	318	296	908
	1985	111	0	55	166	289	0	192	481
	1990	108	0	53	161	378	0	186	564
	1995	107	0	53	160	376	0	187	563

FORECAST 2 - OTHER POSSIBLE DEVELOPMENT

LOCATION	YEAR	EMPLOYMENT				POPULATION			
		PRODN	CONST	SERV	TOTAL	PRODN	CONST	SERV	TOTAL
CRAIG	1976	39	17	27	83	167	34	94	295
	1978	18	17	9	44	64	34	30	128
	1980	17	0	8	25	60	0	28	88
	1985	130	0	63	193	453	0	448	901
	1990	226	0	106	332	790	0	373	8,163
	1995	249	0	117	366	874	0	411	1,285
HAYDEN	1976	57	20	32	109	198	40	111	349
	1978	22	20	10	52	16	40	35	91
	1980	23	0	11	34	81	0	37	118
	1985	87	0	43	130	305	0	153	458
	1990	132	0	63	195	463	0	218	681
	1995	137	0	64	201	479	0	225	704
MEEKER	1976	2	1	1	4	6	1	2	9
	1978	1	1	1	3	2	1	1	4
	1980	1	0	10	11	1	0	1	2
	1985	19	0	9	28	66	0	31	97
	1990	21	0	10	31	74	0	35	109
	1995	20	0	9	29	70	0	33	103

FORECAST 3A - FILED LETTERS OF INTENT WITH OTHER POSSIBLE DEVELOPMENT - NO NEW TOWN

LOCATION	YEAR	EMPLOYMENT			POPULATION		
		PRODN	CONST	SERV	PRODN	CONST	SERV
CRAIG	1976	199	1,237	423	696	2,474	1,480
	1978	422	540	343	1,478	1,081	1,200
	1980	604	430	407	2,116	861	1,424
	1985	934	0	456	3,269	0	1,599
	1990	1,053	0	511	3,683	0	1,786
	1995	1,087	0	1,526	3,805	0	1,843
HAYDEN	1976	46	30	20	160	59	68
	1978	19	51	22	65	102	79
	1980	97	54	60	338	109	213
	1985	178	0	87	624	0	306
	1990	211	0	100	739	0	350
	1995	214	0	101	748	0	374
MEEKER	1976	36	32	18	126	64	63
	1978	28	63	30	100	127	108
	1980	76	144	80	269	289	279
	1985	118	0	58	414	0	203
	1990	116	0	58	407	0	200
	1995	110	0	51	386	0	190
	1976						
	1978						
	1980						
	1985						
	1990						
	1995						

FORECAST 3B - FILED LETTERS OF INTENT WITH OTHER POSSIBLE DEVELOPMENTS - WITH NEW TOWN

LOCATION	YEAR	EMPLOYMENT			POPULATION		
		PRODN	CONST	SERV	PRODN	CONST	SERV
CRAIG	1976	31	1,068	325	105	2,136	1,136
	1978	219	416	209	769	832	734
	1980	361	303	255	1,262	605	891
	1985	537	0	253	1,879	0	887
	1990	636	0	298	2,227	0	1,045
	1995	665	0	313	2,326	0	1,094
HAYDEN	1976	20	10	7	74	20	27
	1978	11	48	17	38	96	60
	1980	85	51	55	200	102	189
	1985	16	0	77	559	0	272
	1990	195	0	92	683	0	320
	1995	199	0	93	696	0	327
MEEKER	1976	3	6	2	13	13	10
	1978	2	39	12	9	78	41
	1980	28	94	41	98	190	145
	1985	44	0	20	156	0	73
	1990	45	0	21	155	0	73
	1995	43	0	21	151	0	71
NEW TOWN	1976	240	225	121	843	451	424
	1978	249	223	173	874	446	606
	1980	340	280	239	1,191	561	836
	1985	543	0	276	1,901	0	966
	1990	569	0	282	1,994	0	988
	1995	549	0	279	1,922	0	979
	1976						
	1978						
	1980						
	1985						
	1990						
	1995						

FORECAST 5A - ALL FORECAST DEVELOPMENT INCLUDING OIL SHALE - NO NEW TOWN

LOCATION	YEAR	EMPLOYMENT			POPULATION		
		PROD	CONST	SERV	PROD	CONST	SERV
CRAIG	1976	129	1,064	334	451	2,127	1,171
	1978	464	2,490	845	1,623	4,981	2,958
	1980	1,181	540	607	4,135	1,081	2,123
	1985	823	7	394	2,881	14	1,379
	1990	922	0	438	3,225	0	1,534
	1995	963	0	452	3,370	0	1,582
HAYDEN	1976	25	20	13	83	40	45
	1978	18	117	39	63	233	133
	1980	79	42	42	280	82	143
	1985	160	3	78	560	5	274
	1990	192	0	91	675	0	318
	1995	198	0	92	693	0	322
MEEKER	1976	18	23	12	62	45	40
	1978	61	1,045	298	212	2,091	1,042
	1980	1,347	756	724	4,718	1,512	2,533
	1985	2,876	15	1,366	10,067	30	4,778
	1990	2,902	0	1,378	10,155	0	4,823
	1995	2,886	0	1,352	10,101	0	4,732
	1976			53			157
	1978			1,404			3,345
	1980			2,827			8,763
	1985			4,257			14,875
	1990			4,280			14,978
	1995			4,238			14,833

FORECAST 5B - ALL FORECAST DEVELOPMENT INCLUDING OIL SHALE WITH NEW TOWN

LOCATION	YEAR	EMPLOYMENT			POPULATION		
		PRODN	CONST	SERV	PRODN	CONST	SERV
CRAIG	1976	28	1,071	331	98	2,141	1,159
	1978	248	1,562	512	869	3,125	1,792
	1980	718	375	430	2,516	750	1,504
	1985	788	2	372	2,760	5	1,302
	1990	890	0	418	3,115	0	1,462
	1995	934	0	432	3,269	0	1,513
HAYDEN	1976	23	11	9	82	24	31
	1978	11	91	28	39	182	100
	1980	74	43	48	275	87	166
	1985	152	2	74	532	4	258
	1990	181	0	85	637	0	298
	1995	187	0	87	654	0	303
MEEKER	1976	3	4	1	8	8	6
	1978	22	638	175	76	1,276	613
	1980	604	382	371	2,116	763	1,325
	1985	1,268	1	595	4,437	1	2,081
	1990	1,308	0	613	4,577	0	2,148
	1995	1,328	0	614	4,650	0	2,150
NEW TOWN	1976	244	234	127	854	468	445
	1978	282	1,767	579	984	3,534	2,029
	1980	1,435	647	832	5,022	1,293	294
	1985	1,563	20	756	5,470	39	2,647
	1990	1,549	0	749	5,421	0	2,623
	1995	1,514	0	722	5,299	0	2,528
TOTAL	1976	244	234	127	854	468	445
	1978	282	1,767	579	984	3,534	2,029
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TOTAL	1976	244	234	127	854	468	445
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	1980	1,435	647	832	5,022	1,293	294
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TOTAL	1976	244	234	127	854	468	445
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	1980	1,435	647	832	5,022	1,293	294
	1985	1,563	20	756	5,470	39	2,647
	1990	1,549	0	749	5,421	0	2,623
	1995	1,514	0	722	5,299	0	2,528
TOTAL	1976	244	234	127	854	468	445
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	1980	1,435	647	832	5,022	1,293	294
	1985	1,563	20	756	5,470	39	2,647
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	1995	1,514	0	722	5,299	0	2,528
TOTAL	1976	244	234	127	854	468	445
	1978	282	1,767	579	984	3,534	2,029
	1980	1,435	647	832	5,022	1,293	294
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	1980	1,435	647	832	5,022	1,293	294
	1985	1,563	20	756	5,470	39	2,647
	1990	1,549	0	749	5,421	0	2,623
	1995	1,514	0	722	5,299	0	2,528
TOTAL	1976	244	234	127	854	468	445
	1978	282	1,767	579	984	3,534	2,029
	1980	1,435	647	832	5,022	1,293	294
	1985	1,563	20	756	5,470	39	2,647
	1990	1,549	0	749	5,421	0	2,623
	1995	1,514	0	722	5,299	0	2,528
TOTAL	1976	244	234	127	854	468	445
	1978	282	1,767	579	984	3,534	2,029
	1980	1,435	647	832	5,022	1,293	294
	1985	1,563	20	756	5,470	39	2,647
	1990	1,549	0	749	5,421	0	2,623
	1995	1,514	0	722	5,299	0	2,528
TOTAL	1976	244	234	127	854	468	445
	1978	282	1,767	579	984	3,534	2,029
	1980	1,435	647	832	5,022	1,293	294
	1985	1,563	20	756	5,470	39	2,647
	1990	1,549	0	749	5,421	0	2,623
	1995	1,514	0	722	5,299	0	2,528
TOTAL	1976	244	234	127	854	468	445
	1978	282	1,767	579	984	3,534	2,029
	1980	1,435	647	832	5,022	1,293	294
	1985	1,563	20	756	5,470	39	2,647
	1990	1,549	0	749	5,421	0	2,623
	1995	1,514	0	722	5,299	0	2,528
TOTAL	1976	244	234	127	854	468	445
	1978	282	1,767	579	984	3,534	2,029
	1980	1,435	647	832	5,022	1,293	294
	1985	1,563	20	756	5,470	39	2,647
	1990	1,549	0	749	5,421	0	2,623
	1995	1,514	0	722	5,299	0	2,528
TOTAL	1976	244	234	127	854	468	445
	1978	282	1,767	579	984	3,534	2,029
	1980	1,435	647	832	5,022	1,293	294
	1985	1,563	20	756	5,470	39	2,647
	1990	1,549	0	749	5,421	0	2,623
	1995	1,514	0	722	5,299	0	2,528
TOTAL	1976	244	234	127	854	468	445
	1978	282	1,767	579	984	3,534	2,029
	1980	1,435	647	832	5,022	1,293	294
	1985	1,563	20	756	5,470	39	2,647
	1990	1,549	0	749	5,421	0	2,623
	1995	1,514	0	722	5,299	0	2,528
TOTAL	1976	244	234	127	854	468	445
	1978	282	1,767	579	984	3,534	2,029
	1980	1,435	647	832	5,022	1,293	294
	1985	1,563	20	756	5,470	39	2,647
	1990	1,549	0	749	5,421	0	2,623
	1995	1,514	0	722	5,299	0	2,528
TOTAL	1976	244	234	127	854	468	445
	1978	282	1,767	579	984	3,534	2,029
	1980	1,435	647	832	5,022	1,293	294
	1985	1,563	20	756	5,470	39	2,647
	1990	1,549	0	749	5,421	0	2,623
	1995	1,514	0	722	5,299	0	2,528
TOTAL	1976	244	234	127	854	468	445
	1978	282	1,767	579	984	3,534	2,0

FORECAST 6 - COLOWYO MINE DEVELOPMENT

LOCATION	YEAR	EMPLOYMENT			POPULATION		
		PRODN	CONST	SERV	PRODN	CONST	SERV
CRAIG	1976	32	26	21	113	52	73
	1978	148	0	69	515	0	244
	1980	171	0	81	600	0	282
	1985	171	0	81	600	0	282
	1990	171	0	81	600	0	282
	1995	171	0	81	600	0	282
HAYDEN	1976	2	2	1	9	4	6
	1978	10	0	5	35	0	16
	1980	11	0	5	40	0	19
	1985	11	0	5	40	0	19
	1990	11	0	5	40	0	19
	1995	11	0	5	40	0	19
MEEKER	1976	86	70	1	300	140	196
	1978	36	0	17	129	0	60
	1980	40	0	19	141	0	66
	1985	40	0	19	141	0	66
	1990	40	0	19	141	0	66
	1995	40	0	19	141	0	66
	1976						
	1978						
	1980						
	1985						
	1990						
	1995						

FORECAST 7 - RAILROAD DEVELOPMENT

LOCATION	YEAR	EMPLOYMENT			POPULATION				
		PRDND	CONST	SERV	TOTAL	PRDND	CONST	SERV	TOTAL
CRAIG	1976	0	71	18	89	0	142	62	204
	1978	10	69	22	101	34	138	77	249
	1980	20	0	9	30	70	0	33	103
	1985	20	0	9	29	70	0	33	103
	1990	20	0	9	29	70	0	33	103
	1995	20	0	9	29	70	0	33	103
HAYDEN	1976	0	5	1	6	0	9	4	13
	1978	1	5	2	7	2	10	6	18
	1980	1	0	1	2	5	0	2	8
	1985	1	0	1	2	5	0	2	8
	1990	1	0	1	2	5	0	2	8
	1995	1	0	1	2	5	0	2	8
MEEKER	1976	0	16	4	21	0	33	14	47
	1978	2	17	5	24	8	33	18	60
	1980	5	0	2	7	17	0	8	25
	1985	5	0	2	7	17	0	8	25
	1990	5	0	2	7	17	0	8	25
	1995	5	0	2	7	17	0	8	25

APPENDIX F

TABLE 11

EMPLOYMENT AND POPULATION ALLOCATIONS TO MEEKER

LOCATION	EMPLOYMENT				POPULATION				YEAR
	PROD	CONST	SERV	TOTAL	PROD	CONST	SERV	TOTAL	
MEEKER	86.	70.	50.	206.	301.	140.	176.	617.	1975
	38.	22.	21.	81.	134.	44.	72.	250.	1977
	36.	0.	17.	53.	127.	0.	59.	186.	1978
	40.	0.	19.	60.	142.	0.	67.	208.	1979
	40.	0.	19.	59.	141.	0.	66.	207.	1980
	41.	0.	19.	59.	141.	0.	66.	207.	1981
	40.	0.	23.	63.	141.	0.	81.	227.	1982
	40.	0.	23.	63.	140.	0.	80.	220.	1983
	40.	0.	23.	63.	140.	0.	80.	220.	1984
	40.	0.	23.	63.	140.	0.	80.	220.	1985
	40.	0.	23.	63.	140.	0.	80.	220.	1986
	40.	0.	23.	63.	140.	0.	80.	220.	1987

APPENDIX F

PART II

HOUSING ALLOCATION FOR CRAIG, HAYDEN AND MEEKER

<u>Title</u>	<u>Page</u>
Forecast 1 Filed Letters of Intent	A-102
Forecast 3 Filed Letters of Intent and Possible Development	A-103
Forecast 5 All Forecasts, Development Including Oil Shale	A-104
Forecast 6 Colowyo Mine Development	A-105
Forecast 7 Railroad Development	A-106
Forecast 8 Railroad Dependent Developments	A-107

FORECAST 1 - FILED LETTERS OF INTENT

HOUSING TYPE AND YEAR	CRAIG				HAYDEN				MEEKER			
	PRODN	CONST	SERVC	TOTAL	PRODN	CONST	SERVC	TOTAL	PRODN	CONST	SERVC	TOTAL
1976												
SINGLE FAMILY	63	359	182	604	11	6	6	23	14	11	9	34
MULTI-FAMILY	31	251	91	373	6	4	3	13	7	8	5	19
MOBILE HOMES	31	587	91	709	6	10	3	19	7	19	5	30
TOTAL	125	1,197	364	1,686	23	20	12	55	28	38	18	84
1978												
SINGLE FAMILY	192	154	156	502	9	14	10	33	13	18	14	44
MULTI-FAMILY	96	108	78	282	4	10	5	19	6	13	7	26
MOBILE HOMES	96	251	78	425	4	24	5	33	6	29	7	42
TOTAL	384	512	312	1,208	17	48	20	85	25	60	27	112
1980												
SINGLE FAMILY	293	128	200	621	34	6	19	59	40	48	42	130
MULTI-FAMILY	147	89	100	336	17	4	9	31	20	34	21	70
MOBILE HOMES	147	208	100	455	17	10	9	37	20	78	21	119
TOTAL	587	425	400	1,412	68	21	37	126	80	160	84	323
1985												
SINGLE FAMILY	394	0	192	586	38	0	18	56	56	0	28	83
MULTI-FAMILY	197	0	96	293	19	0	9	28	28	0	14	42
MOBILE HOMES	197	0	96	293	19	0	9	28	28	0	14	42
TOTAL	788	0	384	1,172	75	0	36	111	111	0	55	166
1990												
SINGLE FAMILY	397	0	194	590	37	0	18	54	54	0	27	81
MULTI-FAMILY	198	0	97	295	18	0	9	27	27	0	13	40
MOBILE HOMES	198	0	97	295	18	0	9	27	27	0	13	40
TOTAL	793	0	387	1,180	73	0	35	108	108	0	53	161
1995												
SINGLE FAMILY	397	0	194	590	37	0	18	54	54	0	27	81
MULTI-FAMILY	198	0	97	295	18	0	9	27	27	0	13	40
MOBILE HOMES	198	0	97	295	18	0	9	27	27	0	13	40
TOTAL	793	0	387	1,180	73	0	35	108	108	0	53	161

*Columns may not total due to rounding errors

FORECAST 3 - LETTERS OF INTENT AND POSSIBLE DEVELOPMENT*

HOUSING TYPE AND YEAR	CRAIG				HAYDEN				MEEKER			
	PROD'N	CONST	SERV'C	TOTAL	PROD'N	CONST	SERV'C	TOTAL	PROD'N	CONST	SERV'C	TOTAL
1976												
SINGLE FAMILY	100	371	212	682	23	9	10	42	18	10	9	37
MULTI-FAMILY	49	260	106	415	12	6	5	23	9	7	5	20
MOBILE HOMES	49	606	106	762	12	15	5	31	9	16	5	29
TOTAL	199	1,237	423	1,859	46	30	20	96	36	32	18	86
1978												
SINGLE FAMILY	211	162	172	545	10	15	11	36	14	19	15	48
MULTI-FAMILY	106	113	86	305	5	11	6	21	7	13	8	28
MOBILE HOMES	106	265	86	456	5	25	6	35	7	31	8	45
TOTAL	422	540	343	1,305	19	51	22	92	28	63	30	121
1980												
SINGLE FAMILY	302	129	204	635	49	16	30	95	38	43	40	121
MULTI-FAMILY	151	90	102	343	24	11	15	51	19	30	20	69
MOBILE HOMES	151	211	102	463	24	26	15	66	19	71	20	110
TOTAL	604	430	407	1,441	97	54	60	211	76	144	80	300
1985												
SINGLE FAMILY	467	0	228	695	89	0	44	133	59	0	29	88
MULTI-FAMILY	234	0	114	348	45	0	22	66	30	0	15	44
MOBILE HOMES	234	0	114	348	45	0	22	66	30	0	15	44
TOTAL	934	0	456	1,390	178	0	87	265	118	0	58	176
1990												
SINGLE FAMILY	527	0	256	782	106	0	50	156	58	0	29	87
MULTI-FAMILY	263	0	128	391	53	0	25	78	29	0	15	44
MOBILE HOMES	263	0	128	391	53	0	25	78	29	0	15	44
TOTAL	1,053	0	511	1,564	211	0	100	311	116	0	58	174
1995												
SINGLE FAMILY	544	0	263	807	107	0	51	158	55	0	26	81
MULTI-FAMILY	272	0	132	403	54	0	25	79	28	0	13	40
MOBILE HOMES	272	0	132	403	54	0	25	79	28	0	13	40
TOTAL	1,087	0	526	1,613	214	0	101	315	110	0	51	161

*Columns may not total due to rounding errors

FORECAST 5 - ALL FORECAST DEVELOPMENT INCLUDING OIL SHALE

HOUSING TYPE AND YEAR	CRAIG				HAYDEN				NEEKER			
	PRODN	CONST	SERVC	TOTAL	PRODN	CONST	SERVC	TOTAL	PRODN	CONST	SERVC	TOTAL
1976												
SINGLE FAMILY	65	319	167	551	13	6	7	25	9	7	6	22
MULTI-FAMILY	32	223	84	339	6	4	3	14	5	5	3	12
MOBILE HOMES	32	521	84	637	6	10	3	19	5	11	3	19
TOTAL	129	1,064	334	1,527	25	20	13	58	18	23	12	53
1978												
SINGLE FAMILY	232	747	423	1,402	9	35	20	64	31	314	149	493
MULTI-FAMILY	116	523	211	850	5	25	10	39	15	219	75	309
MOBILE HOMES	116	1,220	211	1,547	5	57	10	72	15	512	75	602
TOTAL	464	2,490	845	3,799	18	117	39	174	61	1,045	298	1,404
1980												
SINGLE FAMILY	591	162	304	1,056	40	13	21	73	674	227	362	1,262
MULTI-FAMILY	295	113	152	560	20	9	11	39	337	159	181	677
MOBILE HOMES	295	265	152	712	20	21	11	51	337	370	181	888
TOTAL	1,181	540	607	2,328	79	42	42	163	1,347	756	724	2,827
1985												
SINGLE FAMILY	412	2	197	611	80	1	39	120	1,438	5	683	2,126
MULTI-FAMILY	206	1	99	306	40	1	20	60	719	3	342	1,064
MOBILE HOMES	206	3	99	308	40	1	20	61	719	7	342	1,068
TOTAL	823	7	394	1,224	160	3	78	241	2,876	15	1,366	4,257
1990												
SINGLE FAMILY	461	0	219	680	96	0	46	142	1,451	0	689	2,140
MULTI-FAMILY	231	0	110	340	48	0	23	71	726	0	345	1,070
MOBILE HOMES	231	0	110	340	48	0	23	71	726	0	345	1,070
TOTAL	922	0	438	1,360	192	0	91	283	2,902	0	1,378	4,280
1995												
SINGLE FAMILY	482	0	226	708	99	0	46	145	1,443	0	676	2,119
MULTI-FAMILY	241	0	113	354	50	0	23	73	722	0	338	1,060
MOBILE HOMES	241	0	113	354	50	0	23	73	722	0	338	1,060
TOTAL	963	0	452	1,415	198	0	92	290	2,886	0	1,352	4,238

*Columns may not total due to rounding errors

FORECAST 6 -- COLOWYO MINE DEVELOPMENT*

HOUSING		CRAIG			HAYDEN			MEEKER					
		PRODN	CONST	SERV	TOTAL	PRODN	CONST	SERV	TOTAL	PRODN	CONST	SERV	TOTAL
1976	SINGLE FAMILY	16	8	11	24	1	1	1	2	43	21	28	92
	MULTI-FAMILY	8	5	5	19	1	0	0	1	22	15	14	50
	MOBILE HOMES	8	13	5	26	1	1	0	2	22	34	14	70
	TOTAL	32	26	21	79	2	2	1	5	86	70	56	212
1978	SINGLE FAMILY	74	0	35	109	5	0	3	8	18	0	9	27
	MULTI-FAMILY	37	0	17	54	3	0	1	4	9	0	4	13
	MOBILE HOMES	37	0	17	54	3	0	1	4	9	0	4	13
	TOTAL	148	0	69	217	10	0	5	15	36	0	17	53
1980	SINGLE FAMILY	86	0	41	126	6	0	3	8	20	0	10	30
	MULTI-FAMILY	43	0	20	63	3	0	1	4	10	0	5	15
	MOBILE HOMES	43	0	20	63	3	0	1	4	10	0	5	15
	TOTAL	171	0	81	252	11	0	5	16	40	0	19	59
1985	SINGLE FAMILY	86	0	41	126	6	0	3	8	20	0	10	30
	MULTI-FAMILY	43	0	20	63	3	0	1	4	10	0	5	15
	MOBILE HOMES	43	0	20	63	3	0	1	4	10	0	5	15
	TOTAL	171	0	81	252	11	0	5	16	40	0	19	59
1990	SINGLE FAMILY	86	0	41	126	6	0	3	8	20	0	10	30
	MULTI-FAMILY	43	0	20	63	3	0	1	4	10	0	5	15
	MOBILE HOMES	43	0	20	63	3	0	1	4	10	0	5	15
	TOTAL	171	0	81	252	11	0	5	16	40	0	19	59
1995	SINGLE FAMILY	86	0	41	126	6	0	3	8	20	0	10	30
	MULTI-FAMILY	43	0	20	63	3	0	1	4	10	0	5	15
	MOBILE HOMES	43	0	20	63	3	0	1	4	10	0	5	15
	TOTAL	171	0	81	252	11	0	5	16	40	0	19	59

*Columns may not total due to rounding errors

FORECAST 7 - RAILROAD DEVELOPMENT

HOUSING	TYPE AND YEAR	CRAIG				HAYDEN				MEEKER			
		PRODN	CONST	SERV	TOTAL	PRODN	CONST	SERV	TOTAL	PRODN	CONST	SERV	TOTAL
1976	SINGLE FAMILY	0	21	9	30	0	1	0	1	0	4	2	6
	MULTI-FAMILY	0	14	4	18	0	1	0	1	0	3	1	4
	MOBILE HOMES	0	34	4	38	0	2	0	2	0	7	1	8
	TOTAL	0	69	17	86	0	4	0	4	0	14	4	18
1978	SINGLE FAMILY	5	20	11	36	0	1	1	2	1	5	2	8
	MULTI-FAMILY	2	14	5	21	0	1	0	1	0	3	1	4
	MOBILE HOMES	2	33	5	40	0	2	0	2	0	8	1	9
	TOTAL	9	67	21	97	0	4	1	5	1	16	4	21
1980	SINGLE FAMILY	10	0	4	14	0	0	0	0	2	0	1	3
	MULTI-FAMILY	5	0	2	7	0	0	0	0	1	0	0	1
	MOBILE HOMES	5	0	2	7	0	0	0	0	1	0	0	1
	TOTAL	20	0	8	28	0	0	0	0	4	0	1	5
1985	SINGLE FAMILY	10	0	4	14	0	0	0	0	2	0	1	3
	MULTI-FAMILY	5	0	2	7	0	0	0	0	1	0	0	1
	MOBILE HOMES	5	0	2	7	0	0	0	0	1	0	0	1
	TOTAL	20	0	8	28	0	0	0	0	4	0	1	5
1990	SINGLE FAMILY	10	0	4	14	0	0	0	0	2	0	1	3
	MULTI-FAMILY	5	0	2	7	0	0	0	0	1	0	0	1
	MOBILE HOMES	5	0	2	7	0	0	0	0	1	0	0	1
	TOTAL	20	0	8	28	0	0	0	0	4	0	1	5
1995	SINGLE FAMILY	10	0	4	14	0	0	0	0	2	0	1	3
	MULTI-FAMILY	5	0	2	7	0	0	0	0	1	0	0	1
	MOBILE HOMES	5	0	2	7	0	0	0	0	1	0	0	1
	TOTAL	20	0	8	28	0	0	0	0	4	0	1	5

FORECAST 8 - RAILROAD DEPENDENT DEVELOPMENTS

LOCATION	YEAR	EMPLOYMENT			POPULATION		
		PRODN	CONST	SERV	PRODN	CONST	SERV
CRAIG	1976	85	138	75	298	275	262
	1978	165	138	112	415	276	392
	1980	293	170	180	643	340	630
	1985	359	12	185	556	25	646
	1990	394	0	198	592	0	694
	1995	396	0	199	595	0	696
HAYDEN	1976	6	10	6	22	21	19
	1978	11	9	7	27	18	26
	1980	18	10	11	39	21	39
	1985	46	3	25	74	6	89
	1990	80	0	39	119	0	135
	1995	86	0	41	127	0	144
MEEKER	1976	21	33	18	72	67	64
	1978	40	109	47	196	218	162
	1980	284	333	217	833	665	758
	1985	693	8	335	1,036	16	1,125
	1990	695	0	337	1,032	0	1,179
	1995	690	0	334	1,024	0	1,169
	1976				71		618
	1978				139		519
	1980				993		2,416
	1985				2,424		3,565
	1990				2,433		3,612
	1995				2,414		3,583
	1976				298		835
	1978				578		1,246
	1980				1,024		1,994
	1985				1,259		1,930
	1990				1,381		2,075
	1995				1,385		2,081
	1976				22		62
	1978				38		82
	1980				63		122
	1985				161		256
	1990				281		416
	1995				300		444
	1976				71		618
	1978				139		519
	1980				993		2,416
	1985				2,424		3,565
	1990				2,433		3,612
	1995				2,414		3,583

APPENDIX F

PART III

HOUSING SUMMARIES

(TOTAL HOUSING REQUIRED BY FORECAST)

<u>Title</u>	<u>Page</u>
Forecast 1 Filed Letter of Interest	A-110
Forecast 2 Possible Development	A-111
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Forecast 5 All Forecast Development Including Oil Shale	A-113
Forecast 6 Colowyo Mine Development	A-114
Forecast 7 Railroad Development	A-115

1 FILED LETTERS OF INTENT*

	PRODN	CONST	SERV	TOTAL	LOCATION	PRODN	CONST	SERV	TOTAL
TOTAL									
1976					1982				
SINGLE FAMILY	95	380	205	680	SINGLE FAMILY	500	0	250	750
MULTI-FAMILY	45	280	100	425	MULTI-FAMILY	250	0	120	370
MOBILE HOMES	50	620	105	775	MOBILE HOMES	255	0	120	375
TOTAL	190	1280	410	1880	TOTAL	1005	0	490	1495
1977					1983				
SINGLE FAMILY	155	520	215	890	SINGLE FAMILY	500	0	250	750
MULTI-FAMILY	75	360	105	540	MULTI-FAMILY	250	0	120	370
MOBILE HOMES	80	850	110	1040	MOBILE HOMES	255	0	120	375
TOTAL	310	1730	430	2470	TOTAL	1005	0	490	1495
1978					1984				
SINGLE FAMILY	225	215	210	650	SINGLE FAMILY	550	0	270	820
MULTI-FAMILY	110	150	105	365	MULTI-FAMILY	275	0	135	410
MOBILE HOMES	110	360	100	570	MOBILE HOMES	275	0	135	410
TOTAL	445	725	415	1585	TOTAL	1100	0	540	1640
1979					1985				
SINGLE FAMILY	255	225	220	700	SINGLE FAMILY	565	0	275	840
MULTI-FAMILY	130	160	110	400	MULTI-FAMILY	275	0	135	410
MOBILE HOMES	125	370	110	605	MOBILE HOMES	285	0	140	425
TOTAL	510	755	440	1705	TOTAL	1125	0	550	1675
1980					1990				
SINGLE FAMILY	415	265	330	1010	SINGLE FAMILY	565	0	275	840
MULTI-FAMILY	210	180	160	550	MULTI-FAMILY	275	0	135	410
MOBILE HOMES	205	460	165	830	MOBILE HOMES	285	0	140	425
TOTAL	830	905	655	2390	TOTAL	1125	0	550	1675
1981					1995				
SINGLE FAMILY	500	270	345	1115	SINGLE FAMILY	565	0	275	840
MULTI-FAMILY	250	190	170	610	MULTI-FAMILY	275	0	135	410
MOBILE HOMES	255	440	175	870	MOBILE HOMES	285	0	140	425
TOTAL	1005	900	690	2595	TOTAL	1125	0	550	1675

*Rounded to the nearest 5

2 POSSIBLE DEVELOPMENT*

	PRODN	CONST	SERV	TOTAL	LOCATION	PRODN	CONST	SERV	TOTAL
	-----	-----	-----	-----	-----	-----	-----	-----	-----
TOTAL									
1976					1982				
SINGLE FAMILY	55	10	30	95	SINGLE FAMILY	20	0	15	35
MULTI-FAMILY	30	10	15	55	MULTI-FAMILY	10	0	10	20
MOBILE HOMES	25	20	20	65	MOBILE HOMES	15	0	5	20
TOTAL	110	40	65	215	TOTAL	45	0	30	75
1977					1983				
SINGLE FAMILY	25	10	10	45	SINGLE FAMILY	65	0	55	120
MULTI-FAMILY	10	10	5	25	MULTI-FAMILY	30	0	25	55
MOBILE HOMES	10	20	5	35	MOBILE HOMES	30	0	30	60
TOTAL	45	40	20	105	TOTAL	125	0	110	235
1978					1984				
SINGLE FAMILY	25	10	10	45	SINGLE FAMILY	90	0	50	145
MULTI-FAMILY	10	10	5	25	MULTI-FAMILY	45	0	25	70
MOBILE HOMES	10	20	5	35	MOBILE HOMES	50	0	30	80
TOTAL	45	40	20	105	TOTAL	185	0	105	290
1979					1985				
SINGLE FAMILY	25	0	10	35	SINGLE FAMILY	125	0	65	195
MULTI-FAMILY	10	0	5	15	MULTI-FAMILY	60	0	30	90
MOBILE HOMES	10	0	5	15	MOBILE HOMES	65	0	30	90
TOTAL	45	0	20	65	TOTAL	250	0	125	375
1980					1990				
SINGLE FAMILY	25	0	10	35	SINGLE FAMILY	200	0	95	295
MULTI-FAMILY	10	0	5	15	MULTI-FAMILY	100	0	45	145
MOBILE HOMES	10	0	5	15	MOBILE HOMES	100	0	50	150
TOTAL	45	0	20	65	TOTAL	400	0	190	590
1981					1995				
SINGLE FAMILY	25	0	10	35	SINGLE FAMILY	215	0	100	315
MULTI-FAMILY	10	0	5	15	MULTI-FAMILY	105	0	50	155
MOBILE HOMES	10	0	5	15	MOBILE HOMES	105	0	50	155
TOTAL	45	0	20	65	TOTAL	425	0	200	625

*Rounded to nearest 5

3 LETTERS OF INTENT AND POSSIBLE DEVELOPMENT*

		PROD	CONST	SERV	TOTAL	LOCATION	PROD	CONST	SERV	TOTAL
		-----	-----	-----	-----	-----	-----	-----	-----	-----
TOTAL										
1976						1982				
SINGLE FAMILY	155	390	235	780		SINGLE FAMILY	525	0	270	795
MULTI-FAMILY	75	275	120	470		MULTI-FAMILY	260	0	135	395
MOBILE HOMES	75	655	115	845		MOBILE HOMES	265	0	135	400
TOTAL	305	1320	470	2095		TOTAL	1050	0	540	1590
1977						1983				
SINGLE FAMILY	180	530	225	935		SINGLE FAMILY	565	0	300	865
MULTI-FAMILY	85	370	110	565		MULTI-FAMILY	280	0	150	430
MOBILE HOMES	90	870	115	1075		MOBILE HOMES	285	0	150	435
TOTAL	355	1770	450	2575		TOTAL	1130	0	600	1730
1978						1984				
SINGLE FAMILY	240	230	220	690		SINGLE FAMILY	615	0	320	935
MULTI-FAMILY	120	165	105	390		MULTI-FAMILY	305	0	160	465
MOBILE HOMES	125	370	110	605		MOBILE HOMES	310	0	160	470
TOTAL	485	765	435	1685		TOTAL	1230	0	640	1870
1979						1985				
SINGLE FAMILY	280	225	400	905		SINGLE FAMILY	690	0	335	1025
MULTI-FAMILY	135	160	200	495		MULTI-FAMILY	345	0	170	515
MOBILE HOMES	140	370	200	710		MOBILE HOMES	345	0	165	510
TOTAL	555	755	800	2110		TOTAL	1380	0	670	2050
1980						1990				
SINGLE FAMILY	440	270	340	1050		SINGLE FAMILY	765	0	370	1135
MULTI-FAMILY	215	195	170	580		MULTI-FAMILY	380	0	185	565
MOBILE HOMES	220	440	170	830		MOBILE HOMES	380	0	185	565
TOTAL	875	905	680	2460		TOTAL	1525	0	740	2265
1981						1995				
SINGLE FAMILY	525	270	360	1155		SINGLE FAMILY	775	0	375	1150
MULTI-FAMILY	260	190	180	630		MULTI-FAMILY	390	0	185	575
MOBILE HOMES	265	440	185	890		MOBILE HOMES	385	0	190	575
TOTAL	1050	900	725	2675		TOTAL	1550	0	750	2300

* Rounded to nearest 5

5 ALL FORECAST DEVELOPMENT INCLUDING OIL SHALE*

		PRODN	CONST	SERV	TOTAL	LOCATION	PRODN	CONST	SERV	TOTAL
		-----				-----	-----			
TOTAL										
1976						1982				
SINGLE FAMILY	150	395	235	780		SINGLE FAMILY	1875	40	910	2825
MULTI-FAMILY	75	280	115	470		MULTI-FAMILY	935	25	450	1410
MOBILE HOMES	75	650	120	845		MOBILE HOMES	940	65	455	1460
TOTAL	300	1325	470	2095		TOTAL	3750	130	1815	5695
1977						1983				
SINGLE FAMILY	175	635	350	1160		SINGLE FAMILY	1915	60	935	2910
MULTI-FAMILY	85	445	175	705		MULTI-FAMILY	955	40	465	1460
MOBILE HOMES	90	1040	180	1310		MOBILE HOMES	960	100	465	1525
TOTAL	350	2120	705	3175		TOTAL	3830	200	1865	5895
1978						1984				
SINGLE FAMILY	295	1480	765	2540		SINGLE FAMILY	1995	20	955	2970
MULTI-FAMILY	150	1030	380	1560		MULTI-FAMILY	995	15	475	1485
MOBILE HOMES	145	2415	385	2945		MOBILE HOMES	1000	40	480	1520
TOTAL	590	4925	1530	7045		TOTAL	3990	75	1910	5975
1979						1985				
SINGLE FAMILY	875	1320	945	3140		SINGLE FAMILY	2040	10	970	3020
MULTI-FAMILY	435	925	475	1835		MULTI-FAMILY	1020	5	485	1510
MOBILE HOMES	440	2155	475	3070		MOBILE HOMES	1020	10	485	1515
TOTAL	1750	4400	1895	8045		TOTAL	4080	25	1940	6045
1980						1990				
SINGLE FAMILY	1635	515	975	3125		SINGLE FAMILY	2110	0	1005	3110
MULTI-FAMILY	815	360	490	1665		MULTI-FAMILY	1060	0	500	1560
MOBILE HOMES	820	825	490	2135		MOBILE HOMES	1055	0	500	1560
TOTAL	3270	1700	1955	6925		TOTAL	4225	0	2005	6230
1981						1995				
SINGLE FAMILY	2025	280	1065	3370		SINGLE FAMILY	2125	0	995	3120
MULTI-FAMILY	1010	200	535	1745		MULTI-FAMILY	1065	0	500	1560
MOBILE HOMES	1015	460	530	2005		MOBILE HOMES	1060	0	495	1560
TOTAL	4050	940	2130	7120		TOTAL	4250	0	1990	6240

*Rounded to nearest 5

6 COLOWYO MINE DEVELOPMENT*

	PRODN	CONST	SERV	TOTAL	LOCATION	PRODN	CONST	SERV	TOTAL
	-----	-----	-----	-----	-----	-----	-----	-----	-----
TOTAL									
1976					1982				
SINGLE FAMILY	65	20	50	135	SINGLE FAMILY	120	0	60	180
MULTI-FAMILY	30	10	10	50	MULTI-FAMILY	60	0	30	90
MOBILE HOMES	30	70	20	120	MOBILE HOMES	65	0	25	90
TOTAL	125	100	80	305	TOTAL	245	0	115	360
1977					1983				
SINGLE FAMILY	90	30	55	175	SINGLE FAMILY	120	0	60	180
MULTI-FAMILY	40	20	25	85	MULTI-FAMILY	60	0	30	90
MOBILE HOMES	45	50	30	125	MOBILE HOMES	65	0	25	90
TOTAL	175	100	110	385	TOTAL	245	0	115	360
1978					1984				
SINGLE FAMILY	110	0	50	160	SINGLE FAMILY	120	0	60	180
MULTI-FAMILY	50	0	25	75	MULTI-FAMILY	60	0	30	90
MOBILE HOMES	50	0	25	75	MOBILE HOMES	65	0	25	90
TOTAL	210	0	100	310	TOTAL	245	0	115	360
1979					1985				
SINGLE FAMILY	120	0	60	180	SINGLE FAMILY	120	0	60	180
MULTI-FAMILY	60	0	25	85	MULTI-FAMILY	60	0	30	90
MOBILE HOMES	60	0	30	90	MOBILE HOMES	65	0	25	90
TOTAL	240	0	115	355	TOTAL	245	0	115	360
1980					1990				
SINGLE FAMILY	120	0	60	180	SINGLE FAMILY	120	0	60	180
MULTI-FAMILY	60	0	30	90	MULTI-FAMILY	60	0	30	90
MOBILE HOMES	65	0	25	90	MOBILE HOMES	65	0	25	90
TOTAL	245	0	115	360	TOTAL	245	0	115	360
1981					1995				
SINGLE FAMILY	120	0	60	180	SINGLE FAMILY	120	0	60	180
MULTI-FAMILY	60	0	30	90	MULTI-FAMILY	60	0	30	90
MOBILE HOMES	65	0	25	90	MOBILE HOMES	65	0	25	90
TOTAL	245	0	115	360	TOTAL	245	0	115	360

*Rounded to nearest 5

7 RAILROAD DEVELOPMENT*

	PROD N	CONST	SERV C	TOTAL	LOCATION	PROD N	CONST	SERV C	TOTAL
					-----				-----
TOTAL									
1976					1982				
SINGLE FAMILY	0	30	10	40	SINGLE FAMILY	20	0	5	25
MULTI-FAMILY	0	0	0	5	MULTI-FAMILY	5	0	5	10
MOBILE HOMES	0	70	15	80	MOBILE HOMES	5	0	5	10
TOTAL	0	100	25	125	TOTAL	30	0	15	45
1977					1983				
SINGLE FAMILY	0	30	10	40	SINGLE FAMILY	20	0	5	25
MULTI-FAMILY	0	0	0	5	MULTI-FAMILY	5	0	5	10
MOBILE HOMES	0	70	15	80	MOBILE HOMES	5	0	5	10
TOTAL	0	100	25	125	TOTAL	30	0	15	45
1978					1984				
SINGLE FAMILY	10	30	10	50	SINGLE FAMILY	20	0	5	25
MULTI-FAMILY	5	0	5	10	MULTI-FAMILY	5	0	5	10
MOBILE HOMES	0	70	10	80	MOBILE HOMES	5	0	5	10
TOTAL	15	100	25	140	TOTAL	30	0	15	45
1979					1985				
SINGLE FAMILY	20	0	5	25	SINGLE FAMILY	20	0	5	25
MULTI-FAMILY	5	0	5	10	MULTI-FAMILY	5	0	5	10
MOBILE HOMES	5	0	5	10	MOBILE HOMES	5	0	5	10
TOTAL	30	0	15	45	TOTAL	30	0	15	45
1980					1990				
SINGLE FAMILY	20	0	5	25	SINGLE FAMILY	20	0	5	25
MULTI-FAMILY	5	0	5	10	MULTI-FAMILY	5	0	5	10
MOBILE HOMES	5	0	5	10	MOBILE HOMES	5	0	5	10
TOTAL	30	0	15	45	TOTAL	30	0	15	45
1981					1995				
SINGLE FAMILY	20	0	5	25	SINGLE FAMILY	20	0	5	25
MULTI-FAMILY	5	0	5	10	MULTI-FAMILY	5	0	5	10
MOBILE HOMES	5	0	5	10	MOBILE HOMES	5	0	5	10
TOTAL	30	0	15	45	TOTAL	30	0	15	45

*Rounded to nearest 5

APPENDIX G

ATTITUDINAL SURVEYS

- PART I CRAIG DEVELOPMENT STUDY
- PART II AREA OPINION SURVEY, MEEKER, COLORADO
- PART III HANNA BASIN COMMUNITY SERVICES QUESTIONNAIRE
- PART IV OIL SHALE OPINION SURVEY

PART I
CRAIG DEVELOPMENT STUDY

FIRST, we would like to ask some questions about the whole issue of growth, especially as it might occur in the Craig area.

1. The population of Craig is currently around 6000 people. What is the largest number of people you would want to see living here ten years from now? _____

2. Moffat County presently has about 9000 people. What is the largest number of people you would want to see living in the county ten years from now? _____

3. Would you want to see growth occur around here if it were only for a short time, followed by a drop again? ☐ Yes ☐ Unsure ☐ No
4. Do you feel the pace of growth in Craig has been...
 ☐ Too slow ☐ About right ☐ Too fast
5. What do you see as the costs of growth for Craig? _____

6. What do you see as the benefits of growth for Craig? _____

7. To your way of thinking, are the costs you outlined...
 ☐ More than the benefits
 ☐ About equal to the benefits
 ☐ Less than the benefits
 ☐ No opinion/unsure
8. Of the groups I read off, which should be the main one to pay for growth?
 ☐ New industry ☐ Incoming population ☐ Merchants
 ☐ Existing population ☐ Developers ☐ Other (_____)
9. Which should be the last one to pay for growth?
 ☐ New industry ☐ Incoming population ☐ Merchants
 ☐ Existing population ☐ Developers ☐ Other (_____)
10. Can you identify any group within the population that would be most hurt by growth?

 In what way? _____

11. Can you identify any group within the population that would be most benefited by growth?

 In what way? _____

12. Has planning for growth in Craig been...
a. ☐ Handled very well ☐ Handled okay ☐ Handled poorly
b. ☐ Too little ☐ About right ☐ Too much
c. ☐ Even-handed ☐ Favorable to a few

13. Should Craig engage in any further annexation? ☐ Yes ☐ Unsure ☐ No

If YES, under what conditions or for what reasons? _____

If NO, why not? _____

14. Can you tell where Craig begins and ends now? ☐ Yes ☐ Unsure ☐ No

15. How important is that to you?

☐ Very imp. ☐ Imp. ☐ Unsure ☐ Unimp. ☐ Very unimp.

16. Do you think that increased mining or a power plant operation will have...

☐ A positive effect on the natural environment

☐ No effect on the natural environment

☐ A negative effect on the natural environment

In what way? _____

17. What situation /event/person currently presents the biggest threat to the natural environment around here?

18. What aspects of the physical appearance of Craig would be...

Helped as a result of growth _____

Worsened as a result of growth _____

NEXT, we have some questions about where exactly growth might take place in the Craig area.

1. If growth is to occur in this region as part of increased mining activity or power plant construction, where should that growth occur?

☐ In and around existing communities primarily

☐ In a new town primarily

☐ In a new town as well as in and around existing communities

2. Would you want to see growth occur in or around any of these following towns?

	Yes	Unsure	No		Yes	Unsure	No
Craig	1	2	3	Rangely	1	2	3
Steamboat Springs	1	2	3	Hayden	1	2	3
Rifle	1	2	3	Axial	1	2	3
Meeker	1	2	3	Maybell	1	2	3

3. If there is to be a new town for a mine ☐ Near Craig or power plant, should it be located... ☐ Near the mine or power plant

4. If a new town were to develop near Craig, how close would you want it to be to Craig?

☐ Closer than 5 miles

☐ 6-25 miles away

☐ 26-50 miles away

☐ More than 50 miles away

5. Of the possible growth sites on this map, which one do you feel would be best for a new town of several thousand people, and why? Which one would be worst for a new town, and why?

Best: _____

Worst: _____

GROWTH can change the life of a community in many cases. Let's talk about what you see possibly happening in Craig.

1. Many communities have some basic lines along which the population is divided; maybe it's the whites vs. the non-whites, or the people on the hill vs. the people in the valley, etc. What are the most important lines along which the population of Craig is divided?
- _____

2. Sometimes when a community grows in population, it becomes harder to know a lot of people.

	Yes	Unsure	No
Have you experienced this in Craig already?	1	2	3
Do you think this would happen if the population grew from 6000 to 20,000 + in ten years?	1	2	3
From 6000 to 15,000 in ten years?	1	2	3
From 6000 to 10,000 in ten years?	1	2	3

3. What kind of sense of community do you feel Craig now has?

____ Strong sense of community
____ Adequate/so-so
____ Weak sense of community
____ No opinion/unsure

4. Generally when a community gets larger, the variety of people becomes wider. How would you regard this if it were to happen in Craig?

____ Good for the town
____ Good & bad for town
____ Bad for the town
____ No opinion/unsure

5. Can you think of any social conflicts here that would be heightened/made worse by growth?
- _____
- _____

6. Can you think of any social conflicts here that would be lessened/decreased by growth?
- _____
- _____

7. Do you see any problem for newcomers in adjusting to Craig?

____ Yes ____ Unsure ____ No

8. Do newcomers seem to be welcomed by the community?

____ Yes ____ Unsure ____ No

9. If the town's population were to grow, could you imagine a situation where...

	Yes	Unsure	No
There are too many people to fill the available community leadership positions	1	2	3
There are too many new positions of community leadership created & not enough people to fill them	1	2	3

GROWTH can also have effects on things like the economy, government, schools, and so forth. We have a few questions about your views on those situations.

1. Do you see that growth would have any impact on the business community here?

 Good Mixed Bad No opinion/unsure

Explain _____

2. Do you think growth would have any economic or financial impact upon you personally? Good Mixed Bad No opinion/unsure

Explain _____

3. Would the school system be benefited or hurt by population growth in Craig?
 Benefited Mixed consequences Hurt Unsure/no opin.

In what ways? _____

4. Would increased population in Craig make local government more or less responsive, or have no impact on their responsiveness to the people?

More No diff Less

Craig town council

1

2

3

County commissioners

1

2

3

5. What community facilities or services do you think would be most overburdened by growth? _____

6. Which ones do you think would most likely get developed/improved in the wake of growth? _____

NOW we need to know a few facts about you and your family to understand better your answers to the other questions.

1. What is your age? _____ Sex: F M Jt Ot Eth: An Bl Ch Or Ot

2. What is your marital status?

Married Single Separated Divorced Widowed Living Together

3 What is your spouse's age? _____

4. Do you have any children living at home? or any other persons?

Ages: _____ Others: _____

5. How many years have you lived...

in Craig _____ in Moffat County _____ in Colorado _____

6. Do you have any plans to move soon? Yes Unsure No

If YES, why? _____

7. If you could not live in Craig, what would be your second choice of a place to live? _____

8. Do you own or rent this house? Own Rent

Type of dwelling: _____ Single family _____ Apartment _____ Other
_____ Mobile home _____ Motel _____ (_____)

9. What is the highest level of formal education you completed?

_____ Under 7 years of school	_____ 1 to 4 years of college/business
_____ 7 to 9 years of school	_____ school (or AA degree but not
_____ 10 to 11 years of school	_____ bachelor's degree)
_____ (part of high school)	_____ 4 year college graduate (bachelor's
_____ High school graduate	_____ degree)
	_____ Received professional degree (MA,
	_____ MS, PhD, law degree, MD, etc.)

10. What is your present occupation? _____

11. Your spouse's? _____

12. Where did you meet most of your friends, or people with whom you socialize most frequently, in Craig? (multiple answers if applicable)

_____ At work	_____ At local bars
_____ At church	_____ At neighbors
_____ At clubs/community activities	_____ Other (_____)
_____ At recreational activities	

13. In which of the following categories would your annual family income be?

_____ Under \$4000	_____ \$7000 - \$9999	_____ \$15,000 - \$24,999
_____ \$4000 - \$6999	_____ \$10,000 - \$14,999	_____ \$25,000 and over

14. Are there any other comments you would like to make?

CHARACTERISTICS OF THE SAMPLE
(Percentages)

Age

	Respondent	Spouse		Respondent	Spouse
Under 19	2.4	2.8	Under 30	33.0	32.4
20 - 29	30.6	29.6			
30 - 39	24.7	26.8	30 - 49	36.5	46.5
40 - 49	11.8	19.7			
50 - 59	11.8	11.3	50 and over	30.4	21.1
60 - 64	8.2	2.8			
65 and over	10.4	7.0			

Sex

Female	66.7
Male	24.1
Joint	9.2

Ethnicity

Anglo	90.8
Chicano	5.7
No Response	3.4

TOTAL RESPONSES: 87

Marital Status

Married	80.5
Single	6.9
Separated	3.4
Divorced	1.1
Widowed	6.9
No Response	1.1

Children at home

None	37.9
1	17.2
2	27.6
3	12.6
4	2.3
5	2.3

Family Life Cycle Stage

Pre-child	9.2	35.6
Child-bearing	26.4	
Child-rearing	25.3	32.2
Child-launching	6.9	
Post-child	2.3	32.1
Older, childless	21.8	
Widow/widower	8.0	

Years in Craig/Moffat County/Colorado

	Craig	County	State
Less than 1 year	22.1	20.0	7.1
1.0 - 2.9 years	9.3	9.4	9.4
3.0 - 4.9 years	3.9	3.5	3.5
5.0 - 6.9 years	5.8	5.9	1.2
7.0 - 8.9 years	3.5	3.5	1.2
9.0 - 10.9 years	4.7	3.5	2.4
11.0 - 19.9 years	15.1	11.8	14.1
20.0 or more years	36.0	42.4	61.2

Plans to move

Yes 5.7
Unsure 10.3
No 83.9

Reason for moving

Retiring 2.2
Weather 1.1
Other 1.1
No Response 1.1
Not App. 94.3

Second choice home

Western Colorado	33.3	}	48.0
Front Range Colorado	10.7		
Elsewhere Colorado	4.0		
Montana	9.3		
Other Western state	21.3		
Elsewhere USA	9.3		
Warmer climate	4.0		
Small community	2.7		
Other	5.3		

Own/Rent

Own 69.8
Rent 30.2

Type dwelling

Single family 73.6
Mobile home 14.9
Apartment 11.5

Formal education

Less than 7 years	2.3	}	58.0
7 - 9 years	8.1		
10 - 11 years	13.9		
High school graduate	33.7	}	42.0
Some college	32.6		
College graduate	3.5		
Professional degree	5.8		

Occupation

	Respondent	Spouse
Professional	10.3	8.0
Managerial	11.5	9.2
Sales	3.4	8.0
Clerical	4.6	2.3
Craftspeople	3.4	6.9
Operatives	-	1.1
Transportation operative	1.1	9.2
Laborers	6.9	11.5
Farm laborers	1.1	-
Service workers	5.7	10.3
Retired	9.2	3.4
Unemployed	2.3	-
Housespouse	37.9	10.3
No Response/Not Applicable	2.3	19.5

Socializing places (multiple responses allowed)

At work	54.0
At church	41.4
At clubs, etc.	36.8
At recreation	31.0
At local bars	4.6
At neighbors	49.4
Other	22.4

Family income

Under \$4000	5.7	} 37.7
\$4000 - 6999	8.0	
\$7000 - 9999	24.1	
\$10,000 - 14,999	31.0	} 19.5
\$15,000 - 24,999	14.9	
\$25,00 and over	4.6	
No Response	11.5	

PART II
AREA OPINION SURVEY
MEEKER, COLORADO

CONCERNS WITH JOBS FOR YOUTH

- ... How Would You Rate: Exc. Good Fair Poor*
1. Local job opportunities for youth after graduation. _____
 2. Job opportunities for school age youth. _____
- * Please comment on back concerning "Poor" ratings.

CONCERNS WITH RECREATION

- ... How Would You Rate: Exc. Good Fair Poor*
1. Recreational opportunities
 - a. Children _____
 - b. Youth _____
 - c. Adults _____
 - d. Senior citizens _____
- * Please comment on back concerning "Poor" ratings.
- ... What About These Issues: Yes No
2. Should the old football field located between Sixth and Seventh Street and Hill and Cedar street be maintained as a public recreation area? _____
 3. Do you think the present Junior High would make a suitable city hall and recreation area if abandoned by the school district? _____
 4. Should Meeker provide an ice skating rink? _____
 5. Should Meeker provide expanded tennis courts? _____

CONCERNS WITH PLANNING

- ... How Would You Rate: Exc. Good Fair Poor*
1. Availability of adequate housing:
 - a. Trailer space _____
 - b. Apartments _____
 - c. Houses for sale _____
 - d. Houses for rent _____
 - e. Vacant lots for building sites _____
- Please comment on back concerning "Poor" ratings.

CONCERNS WITH EDUCATION

- ... How Would You Rate: Exc. Good Fair Poor*
1. Quality of educational programs
 - a. Elementary school _____
 - b. Junior high _____
 - c. High school _____
 2. Availability of school facilities to the community. _____
 3. Responsiveness of public school personnel to peoples needs _____
 4. Responsiveness of school board to peoples needs. _____
- * Please comment on back concerning "Poor" ratings.
- ... What About These Issues: Yes No
5. Do you feel the present junior high building should be replaced in the near future? _____
 6. If so, should the new junior high school be in a separate location from the high school? _____
 7. Do you think the Meeker school district citizens would pass a bond issue for a new junior high school in the near future? _____
 8. Would you vote in favor of a bond issue for a new junior high school in the near future? _____
 9. Do you think Meeker school district citizens would pass a bond issue for construction of school buildings for increased population caused by oil shale impact? _____
 10. Would you vote in favor of a bond issue for construction of school buildings for increased population caused by oil shale impact? _____
 11. Do you feel the high school library should be open to the public? _____
 12. Do you feel there are enough local informal educational opportunities available? _____
 13. Would you favor extending the Colorado Northwestern Community College (Rangely) School District to include Eastern Rio Blanco County? _____
 14. The maximum size of individual schools should be restricted to: (Circle one answer for each)
 - a. Elementary schools 300 400 500 Other _____ (Specify)
 - b. Jr. High or Middle School 300 400 500 Other _____ (Specify)
 - c. High schools 300 400 500 Other _____ (Specify)

SOURCE: MOFFAT COUNTY
PLANNING COMMISSION

... What About These Issues:

Yes No

2. Do you feel that dilapidated and abandoned buildings in the town should be removed? _____
3. Do you feel residential development should be limited to unproductive agriculture areas? _____
4. Should the Town of Meeker's boundaries be expanded? _____
5. If the results of a planning effort show that land use control is required, would you favor strong local authority? _____

Scale—Strongly Agree, Agree, Disagree, Strongly Disagree.

Strongly Dis- Dis-
Agree Agree agree agree

6. The majority of growth caused by the resource development should occur in Meeker. _____
7. It is desirable that "new towns" be established to handle the resource development. _____
8. We should let communities in Garfield County take the majority of the growth associated with the shale oil development. _____
9. Developers should assume the total cost of new city services for their development. _____
10. To provide adequate quality and quantity of water for domestic and fire protection, it is desirable to improve the facility through a bonding issue. _____

Check your answer on each of the following:

11. With proper planning what percentage of the total housing would you find acceptable as mobile homes within the Meeker community? 20% 30% 40% 50% 60% 70% _____
12. How would you like to see the Meeker area grow? (Check one only)
 - a. ☐ As industrial and mining
 - b. ☐ As a recreation area
 - c. ☐ As a retirement area
 - d. ☐ As a combination of the above
 - e. ☐ Not at all
13. From the current population level of approximately 1700, to what amount would you like to see Meeker grow? (Check one only)
 - a. ☐ No growth
 - b. ☐ 3000 — 5000
 - c. ☐ 6000 — 10000
 - d. ☐ 10000 — 15000
 - e. ☐ Over 15000

CONCERNS WITH PUBLIC UTILITIES

... How Would You Rate: Exc. Good Fair Poor*

1. Quality of water in Meeker _____
2. Surface water drainage _____

* Please comment on back concerning "Poor" ratings.

... What About These Issues: Yes No

3. Are you aware that Meeker has a water pressure problem? _____
4. Are you aware that adequate fire protection depends on water pressure zones in the city of Meeker? _____
5. Are you aware of possible summer water rationing in Meeker? _____
6. Should the residents of Meeker participate in a county-wide domestic water system? _____
7. Should town services like sewer and water be extended beyond town limits? _____
8. Are you willing to help share the cost of providing services for new growth? _____

CONCERNS WITH BUSINESS ACTIVITIES

... How Would You Rate: Exc. Good Fair Poor*

1. The attitude of local retailers toward customer service. _____

* Please comment on back concerning "Poor" ratings.

... What About These Issues? Yes No

2. Do you feel that the Meeker area should encourage new retail business enterprises? _____
3. If you have a complaint about a consumer product or service do you know where to go for help? _____

CONCERNS WITH HEALTH CARE

Yes No

1. Should Pioneers Hospital play a more active role in the community in providing for home health nursing? _____
2. Alcoholism, by statute, is now considered a disease rather than a crime. Should the hospital use its facilities for the treatment of the alcoholic in cases where a crime is not involved? _____
3. Should the nursing home be enlarged to provide more nursing home beds? _____

CONCERNS WITH GOVERNMENT

... How Would You Rate: Exc. Good Fair Poor*

1. Government response to community needs:
 - a. Town officials _____
 - b. Town planning and zoning _____
 - c. County officials _____
 - d. County planning and zoning _____
 - e. State officials _____
2. Street or highway maintenance?
 - a. Town _____
 - b. County _____
 - c. State _____
3. Fire protection and equipment _____
4. Law enforcement and police protection
 - a. City police _____
 - b. Sheriff _____

* Please comment on back concerning "Poor" ratings.

... How About These: Yes No

5. Do you feel the community is run by and for a particular group of citizens? (If Yes, please specify the group on the comment page) _____
6. Do you feel that the existing dog control ordinance should be strictly enforced? _____
7. What are the two most important problems facing the Town of Meeker? (Please respond on the comment page.)

GENERAL INFORMATION

1. Sex
 - a. ☐ Male
 - b. ☐ Female
2. What is your principal occupation at the present time?
 - a. ☐ Retired
 - b. ☐ Student
 - c. ☐ Housewife
 - d. ☐ Farming or Ranching
 - e. ☐ Educator
 - f. ☐ Government
 - g. ☐ Business
 - h. ☐ Other _____ (Please specify)
3. Circle last grade completed in school:

Myself: less than 6, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17

Spouse: less than 6, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17
4. Where do you live?
 - a. ☐ In town
 - b. ☐ Outside city limits

5. I presently:

- a. ☐ Own a home
- b. ☐ Lease
- c. ☐ Rent a house
- d. ☐ Rent an apartment
- e. ☐ Other _____ (Please specify)
6. Amount of land you own within the city limits of Meeker.
 - a. ☐ None
 - b. ☐ 1 Lot
 - c. ☐ 2-10 Lots
 - d. ☐ 1 or more acres
7. Number of housing units you own in Meeker.
 - a. ☐ None
 - b. ☐ 1 unit
 - c. ☐ 2-5 units
 - d. ☐ 5 or more units
8. Approximate annual income of your family last year.
 - a. ☐ Under \$1000.00
 - b. ☐ \$1001.00 — \$4999.00
 - c. ☐ \$5000.00 — \$7999.00
 - d. ☐ \$8000.00 — \$12999.00
 - e. ☐ \$13000.00 and over
9. Total of years you have lived in Meeker.
 - a. ☐ Under 1 year
 - b. ☐ 1— 5 years
 - c. ☐ 6—10 years
 - d. ☐ 11—20 years
 - e. ☐ over 20 years
10. If housing were available to suit your needs and budget, would you: (Check one)
 - a. ☐ Buy a new home
 - b. ☐ Buy an older home
 - c. ☐ Buy a new mobile home and put it on a lot of your own
 - d. ☐ Buy a new mobile home and put it on a modern mobile home park containing adequate open space and controls with enforcement
 - e. ☐ Move a mobile home from an existing location to a modern mobile home park containing adequate open space and controls with enforcement

Yes No

11. Are you registered to vote? _____

COMMENT PAGE—If you came to the Meeker area within the last ten years, what three things most attracted you? (Please comment on reverse side.)

CHARACTERISTICS OF THE SAMPLE (Percentage)

<u>Sex</u>		<u>Location of Residence</u>	
Male	56	In town	74
Female	44	Outside City Limits	26

<u>Occupation</u>		<u>Own/Rent</u>	
Retired	23	Own a home	75
Student	2	Lease	1
Housewife	17	Rent a house	12
Farming or Ranching	12	Rent an apartment	3
Educator	6	Other	9
Government	8		
Business	21		
Other	10		

<u>Last Grade Completed in School</u>			<u>Land Ownership within City Limits</u>	
	<u>Self</u>	<u>Spouse</u>		
Less than 6	a	a	None	37
6	a	0	1 lot	19
7	a	0	2-10 lots	41
8	5	6	1 or more acres	3
9	3	2		
10	3	5		
11	5	3		
12	32	38		
13	10	11		
14	10	10		
15	5	3		
16	12	13		
17	13	8		

^a less than one percent

<u>Number of Housing Units Owned in Meeker</u>	
None	51
1 unit	39
2-5 units	9
5 or more units	1

<u>Annual Family Income</u>	
Under 1,000.00	3
\$ 1,001.00 - \$ 4,999.00	14
\$ 5,000.00 - \$ 7,999.00	19
\$ 8,000.00 - \$12,999.00	36
\$13,000 and over	28

<u>Total Years Lived in Meeker</u>	
Under 1 year	7
1 - 5 years	17
6 - 10 years	10
11 - 20 years	11
Over 20 years.	55

If Housing Available to Suit Needs and Budget

Buy a new home	41
Buy an older home	34
Buy a new mobile home and put it on own lot	22
Buy a new mobile home and put in modern mobile home park	2
Move mobile home from existing location to modern mobile home park	12

Registered to Vote

Yes	92
No	8

- * When the results were analyzed it was obvious that many of the respondents were confused as to how to fill out the questionnaire. The number of responses varied greatly between questions. For example, under general information, 325 responses were recorded to question one, and 359 to question eleven. Also, when respondents were asked to rate a number of items, the law of diminishing returns was realized. For example, in concerns with planning, question 2 had 351 responses, and question 5 only 240. Therefore, the results of this study should be taken with the ever popular grain of salt.

HANNA BASIN COMMUNITY SERVICES QUESTIONNAIRE

The Carbon County Planner and the Wyoming Department of Economic Planning and Development need your help in order to understand what services and facilities would help to maintain or improve the quality of life for Hanna Basin residents.

By completing this questionnaire, you can greatly help us by letting us know exactly what you need and how satisfied you are with present community services. It will enable you to have a say in decisions which affect you, your family, and your community.

Please answer each question as completely as you can. A student will return in a few days to pick up the finished questionnaire. All of the information you give us will be kept **STRICTLY CONFIDENTIAL**.

THANK YOU VERY MUCH FOR YOUR ASSISTANCE.

1. About how often would you and your family use the following facilities if they were available in the Hanna/Elmo area? (Please check one box for each facility.)											Please Do Not Write In This Column
	More than twice a day	twice a day	once a day	twice week	once week	once month	twice year	once year	never	don't know	
a. Another high quality restaurant?											1. _____
b. Drive-In Restaurant?											2. _____
c. Bar with music and dancing?											3. _____
d. Bowling alley?											4. _____
e. Movie Theater?											5. _____
f. Cable TV?											6. _____
g. Recreational lake within 5 minutes drive of Hanna/Elmo?											7. _____
h. Ski area located on Kennaday Peak southwest of Elk Mountain?											8. _____
i. Community Recreation Center?											9. _____
j. If NO Community Recreation Center were built, how often would you use the school's gym and/or pool if open every night for public recreation?											10. _____
2. What additional facilities or businesses would you use in your community if they could be provided?											11. _____
											12. _____
											13. _____
											14. _____

COMMUNITY SERVICES

3. How satisfied are you with each of the following services in your area? (Please circle the appropriate number for each service.)						
Very Satisfied	Satisfied	Uncertain	Dissatisfied	Very Dissatisfied		
a. Law enforcement	1	2	3	4	5	15. _____
b. Fire protection	1	2	3	4	5	16. _____
c. Community beautification	1	2	3	4	5	17. _____
d. Water supply	1	2	3	4	5	18. _____
e. Natural gas supply	1	2	3	4	5	19. _____
f. Sewer and Garbage collection	1	2	3	4	5	20. _____
g. Streets and roads	1	2	3	4	5	21. _____
h. Medical services	1	2	3	4	5	22. _____
i. Recreation facilities	1	2	3	4	5	23. _____
j. Shopping facilities	1	2	3	4	5	24. _____
k. Civic and service clubs	1	2	3	4	5	25. _____
l. Youth organizations	1	2	3	4	5	26. _____
m. Mental health services	1	2	3	4	5	27. _____
n. Schools	1	2	3	4	5	28. _____
4. If it were up to you to decide how to spend the public funds for the following services in your local area, how would you spend the money? (Please rank these services 1 through 6, with number 1 receiving the most money and number 6 receiving the least money.)						
_____ Schools						29. _____
_____ Mental health services						30. _____
_____ Medical services						31. _____
_____ Recreation facilities						32. _____
_____ Environmental protection						33. _____
_____ Law enforcement						34. _____

5. How many times do you go outside Carbon County in a month? (Please circle one.)

Never 1 2 3-4 5-9 10-19 20-29 30 or more

35. _____

6. For what reasons do you go outside Carbon County? (Please check one.)

_____ Shopping _____ Business or work _____ Never leave
_____ Medical _____ Vacation _____ Other (please specify)
_____ Recreation _____ Visit friends _____

36. _____

7. Approximately how many times do you go to Rawlins in a month? (Please circle one.)

I live in Rawlins 0 1 2 3-4 5-9 10-19 20-29 30 or more

37. _____

8. For what reasons do you go to Rawlins? (Please check one.)

_____ Shopping _____ Business or work _____ Never go
_____ Medical _____ Vacation _____ Other (please specify)
_____ Recreation _____ Visit friends _____

38. _____

COMMUNITY PROBLEMS

We need to know your opinions about some problems which may be occurring in your community in order to determine what services would be helpful in treating and preventing them.

9. In your opinion, how often do people in your area drink too much alcohol? (Circle one.)

Extremely often Often Sometimes Seldom Never Don't know

39. _____

10. What preventive and treatment facilities would you recommend for your community? (Check all that apply.)

_____ Nothing _____ Expand alcohol education programs
_____ Expand the Alcoholics Anonymous Program _____ Don't know
_____ Develop a County Hospital Alcohol Unit _____ Other (please specify.)
_____ Increase counseling _____

40. _____

11. In your opinion, how often does drug abuse occur in your area? (Circle one.)

Extremely often Often Sometimes Seldom Never Don't know

41. _____

12. If drug education were to be available in your community, by whom would you recommend it be taught? (Check one or more).

_____ School _____ Special clinic _____ Other
_____ Church _____ None taught _____ (Please specify)
_____ Family _____ Don't know _____

42. _____

13. In your opinion, how often do unwanted pregnancies occur in your area? (Circle one.)

Extremely often Often Sometimes Seldom Never Don't know

43. _____

14. If sex education were to be available in your community, by whom would you recommend it be taught? (Check one or more).

_____ School _____ Special clinic _____ Other
_____ Church _____ None taught _____ (Please specify)
_____ Family _____ Don't know _____

44. _____

15. In your opinion, how often does juvenile delinquency occur in your area? (Circle one.)

Extremely often Often Sometimes Seldom Never Don't know

45. _____

16. What do you think should be done about juvenile delinquency? (Check all that apply.)

_____ Nothing _____ More youth recreation facilities
_____ Stricter law enforcement _____ More youth civic and social clubs
_____ Same degree of law enforcement _____ Change certain laws
_____ Less strict law enforcement _____ Don't know
_____ More counseling services _____ Other (please specify)
_____ More youth jobs _____

46. _____

47. _____

17. In your opinion, how often does criminal behavior among adults occur in your area? (Circle one.)

Extremely often Often Sometimes Seldom Never Don't know

48. _____

18. What do you think should be done about criminal behavior? (Check all that apply.)

_____ Nothing _____ More recreation facilities
_____ Stricter law enforcement _____ More civic and social clubs
_____ Same degree of law enforcement _____ Change certain laws
_____ Less strict law enforcement _____ Don't know
_____ More counseling services _____ Other (please specify)
_____ More job opportunities _____

49. _____

50. _____

19. In your opinion, how often do people in your area have family problems? (Circle one.)

Extremely often Often Sometimes Seldom Never Don't know

51. _____

20. What kinds of family counseling do you think are needed? (Check all that apply.)

- | | |
|--|---|
| <input type="checkbox"/> None | <input type="checkbox"/> Nutrition |
| <input type="checkbox"/> Pre-marital | <input type="checkbox"/> Money Management |
| <input type="checkbox"/> Marriage | <input type="checkbox"/> Don't know |
| <input type="checkbox"/> Family planning | <input type="checkbox"/> Other (please specify) |
| <input type="checkbox"/> Child abuse | |

21. In your opinion, how often do people in your area feel depressed or suffer "the blues"? (Circle one.)

Extremely often Often Sometimes Seldom Never Don't know

22. What do you think are the causes of depression in your area? (Check all that apply.)

- | | |
|--|---|
| <input type="checkbox"/> Lack of entertainment | <input type="checkbox"/> Crowded conditions |
| <input type="checkbox"/> Conflicts at work | <input type="checkbox"/> Feeling helpless |
| <input type="checkbox"/> Conflicts at home | <input type="checkbox"/> Don't know |
| <input type="checkbox"/> Lack of goals | <input type="checkbox"/> Other (please specify) |
| <input type="checkbox"/> Lack of friends and acquaintances | |

23. What age groups, if any, are likely to be unemployed in your area? (Circle all that apply.)

Younger than 15 15-19 20-29 30-49 50-65 over 65 None Don't know

24. What kinds of pollution, if any, present a problem in your area?
(Please circle all that apply; then specify what the problems are.)

Air Water Noise People Other None Don't Know

Please specify:

25. If money became available to prevent and treat problems in the following areas, and it were up to you to decide how to spend the money, how would you spend it? (Please rank 1 through 6, with number 1 receiving the most money to number 6 receiving the least money.)

- ☐ alcohol abuse
- ☐ drug abuse
- ☐ family problems
- ☐ juvenile delinquency
- ☐ criminal behavior
- ☐ pollution control

YOUR RESIDENCE

26. What type of housing do you presently live in? (Please check one.)

- | | | |
|--|------------------------------------|---|
| <input type="checkbox"/> Single family house | <input type="checkbox"/> Apartment | <input type="checkbox"/> Other (please specify) |
| <input type="checkbox"/> Mobile home | <input type="checkbox"/> Motel | |

27. How satisfied are you with the type of housing you are presently living in? (Please circle one.)

Very Satisfied Satisfied Uncertain Dissatisfied Very Dissatisfied

28. If housing development occurs in your area, what type of housing would you most like to see developed?
(Please check one.)

- | | | |
|---|-------------------------------------|---|
| <input type="checkbox"/> Single family houses | <input type="checkbox"/> Apartments | <input type="checkbox"/> Other (please specify) |
| <input type="checkbox"/> Mobile homes | <input type="checkbox"/> Motels | |

29. What specific features do you look for when you are looking for a home in a community that is new to you?

30. What population size would you most like your community to be? (Please check one.)

- | | | |
|--|--------------------------------------|---|
| <input type="checkbox"/> fewer than 250 people | <input type="checkbox"/> 1000 - 1999 | <input type="checkbox"/> 10,000 or more |
| <input type="checkbox"/> 251 - 999 | <input type="checkbox"/> 2000 - 9999 | <input type="checkbox"/> No preference |

31. Do you want the development of your area and Carbon County to be regulated by land use planning, (for example: zoning?) (Circle one.)

Yes No Do Not Know

32. Please list the things you like LEAST about living in your area:

33. Please list the things you like MOST about living in your area:

In order to project future service needs, we need the following background information. (All of the information you give us will be kept COMPLETELY CONFIDENTIAL).

34. Please circle the total number of persons in your household.

1 2 3 4 5 6 7 8 or more

85. _____

35. Please list below all the people who are members of your household and indicate their sex and age. (Do not write their names, just their relationship to you. For example: spouse, daughter, friend, boarder.)

86. _____

87. _____

88. _____

89. _____

90. _____

91. _____

92. _____

93. _____

94. _____

95. _____

96. _____

97. _____

98. _____

99. _____

100. _____

101. _____

102. _____

103. _____

104. _____

105. _____

106. _____

107. _____

108. _____

109. _____

Household Members:

Sex (circle one)

Age:

a. Self

M F

b. _____

M F

c. _____

M F

d. _____

M F

e. _____

M F

f. _____

M F

g. _____

M F

h. _____

M F

36. How many years have you lived in:

Wyoming _____ years

Hanna Basin _____ years

Present residence _____ years

110. _____

111. _____

112. _____

37. How many years do you expect to stay in Hanna Basin? _____ years.

113. _____

a. If you do not know how many years, do you plan to:

_____ settle down here

_____ uncertain

114. _____

_____ leave immediately

_____ other (please specify)

_____ stay as long as work is available

38. How long did you stay at your last place of residence before moving to Hanna Basin? (Please check one.)

115. _____

_____ Always lived in Hanna Basin

_____ Less than one year

_____ 1 - 2 years

_____ 3 - 5 years

_____ 6 or more years

39. Where was your last place of residence?

116. _____

40. Where did you meet most of your friends, or people with whom you socialize most frequently, in your local area? (Check all that apply).

_____ at work

_____ local bars

117. _____

_____ at church

_____ neighbors

_____ at clubs or community activities

_____ other (please specify)

_____ at recreation activities

41. What is your present marital status? (Please circle one.)

118. _____

Single

Married

Widowed

Divorced

Separated

42. What is your political party preference? (Please circle one.)

119. _____

Democrat

Independent

Republican

Strong Moderate Leaning

Leaning Moderate Strong

43. Please indicate the highest educational level you have completed. (Please check one.)

120. _____

_____ 0 - 8th grade

_____ College graduate

_____ 9th - 11th grade

_____ College; post graduate

_____ High school graduate

_____ Vo-tech school graduate

_____ Some college

44. What is your present occupation?

121. _____

122. _____

PLEASE GO ON TO THE NEXT PAGE.

45. Which of these ranges would your yearly family income fall into? (Please check one.)

_____ \$3999 or less	_____ \$10,000 - \$14,999
_____ \$4000 - \$6999	_____ \$15,000 - \$24,999
_____ \$7000 - \$9999	_____ \$25,000 or more

123. _____

If you have any comments or recommendations, please feel free to write them in the space below.

THANK YOU VERY MUCH FOR YOUR COOPERATION.

PART IV

OIL SHALE OPINION SURVEY

The report entitled Attitudes and Opinions Related to the Development of an Oil Shale Industry: Regional Development and Land Use Study, compiled by Brickert, Browne and Coddington and Associates, Inc., was prepared for the Oil Shale Regional Planning Commission and Colorado West Area Council of Governments. Although this document examines resident and official opinion on oil shale development specifically, these same attitudes would probably prevail towards any type of mineral development.

The data base for the report consists of information gathered during two surveys taken in 1973. Personal interviews were conducted utilizing a 22-page questionnaire in 200 randomly selected households in each of the three counties (Garfield, Mesa and Rio Blanco). Following the completion of the resident survey, 110 public officials in Garfield, Mesa, Rio Blanco and Moffat Counties were also personally interviewed utilizing a somewhat shorter version of the same questionnaire. All research was conducted by professional market research interviewers trained in the administration of the questionnaire.

In order to obtain a representative picture of the three-county area as a whole, the interviews were weighted by a factor which represented the proportion of that county's population relative to the population of the entire three-county area. The weighting factors for each county were:

Rio Blanco	1
Garfield	3
Mesa	11

Certain questions were analyzed also by factors such as age, income group, employment status, town of residence and life-satisfaction scores.

At the conclusion of each interview, the respondent was given a list of budget priorities which were to be ranked in order of importance. The priority rankings were:

Education (21 percent)

The local economy (18 percent)

Community services (17 percent)

Planning and zoning (13 percent)

Transportation and roads (10 percent)

Health services (6 percent)

Local government (6 percent)

Recreation and leisure (2 percent)

The analysis of the poll indicates that residents of the three-county area are, on the whole, satisfied with their immediate surroundings and quality of life, and desire only limited change. The good climate was the most often mentioned advantage, but "people factors" were rated as very important also. Residents and public officials voiced a high regard for the small communities, the general friendliness of the people, and the casual lifestyle. Residents of Garfield County were particularly appreciative of the mountains, the scenery, and the associated recreational resources. The way of life is so important, in fact, that few individuals credited economic factors with providing personal rewards in their everyday lives.

Residents place a high value on their sense of freedom and control over their lives. When asked to describe their day-to-day lives, the three most commonly used words were "happy", "conservative", and "easy", with few residents choosing adjectives such as "dull", "lonely", or "impersonal." When confronted with questions used in the Harris survey to determine an individual's degree of alienation from his society, residents of this area perceived themselves as having a greater degree of control over their immediate environment than does the average U.S. citizen. Out of maximum alienation score of 6.0, the average score for all residents was 2.2.

Complaints about life in the area ranged from the high cost of living to low wages and a general shortage of employment opportunities. There were also many complaints about inadequate shopping facilities. When asked whether they could anticipate any event that would cause living conditions to deteriorate in the near future, residents of all three counties were in agreement that the single most devastating event would be the occurrence of excessive rapid growth.

Residents and public officials favored growth in the form of retail business, shopping facilities and non-polluting small industry; however, the overall reaction to oil shale development was positive. Development was seen as a means of correcting some of the major deficiencies in the area

such as creating more jobs, a higher pay scale, and improved community facilities. It is interesting to note that three out of five residents predicted no negative environmental damage from development, but much concern was shown for already deficient water supplies and community facilities. There was definite feeling that potential negative effects of this type of growth could be thwarted by intelligent planning.

Residents showed strong reactions regarding land use and zoning. Residents of Garfield and Mesa Counties supported more stringent land use controls, whereas residents of Rio Blanco County were opposed to such measures. Public officials generally supported stricter land use controls too, except in Rio Blanco County, where they were generally opposed. Although no specific program for improving existing planning and zoning was advocated by more than 12 percent of the population, local zoning was consistently supported throughout the three counties. The concept of clustered housing developments with shared open spaces met substantial opposition.

SOURCE: Bickert, Browne and Coddington and Associates, Inc.

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